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MARITIME REPORTER AND ENGINEERING NEWS

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May 2016

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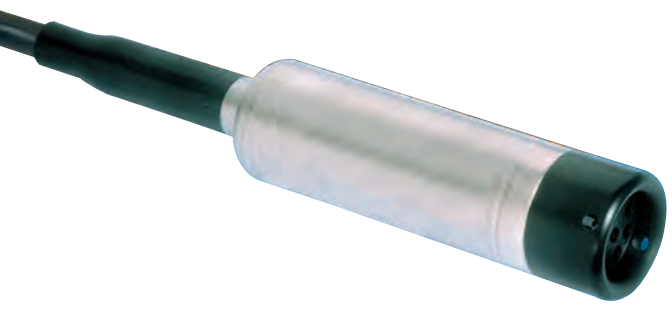

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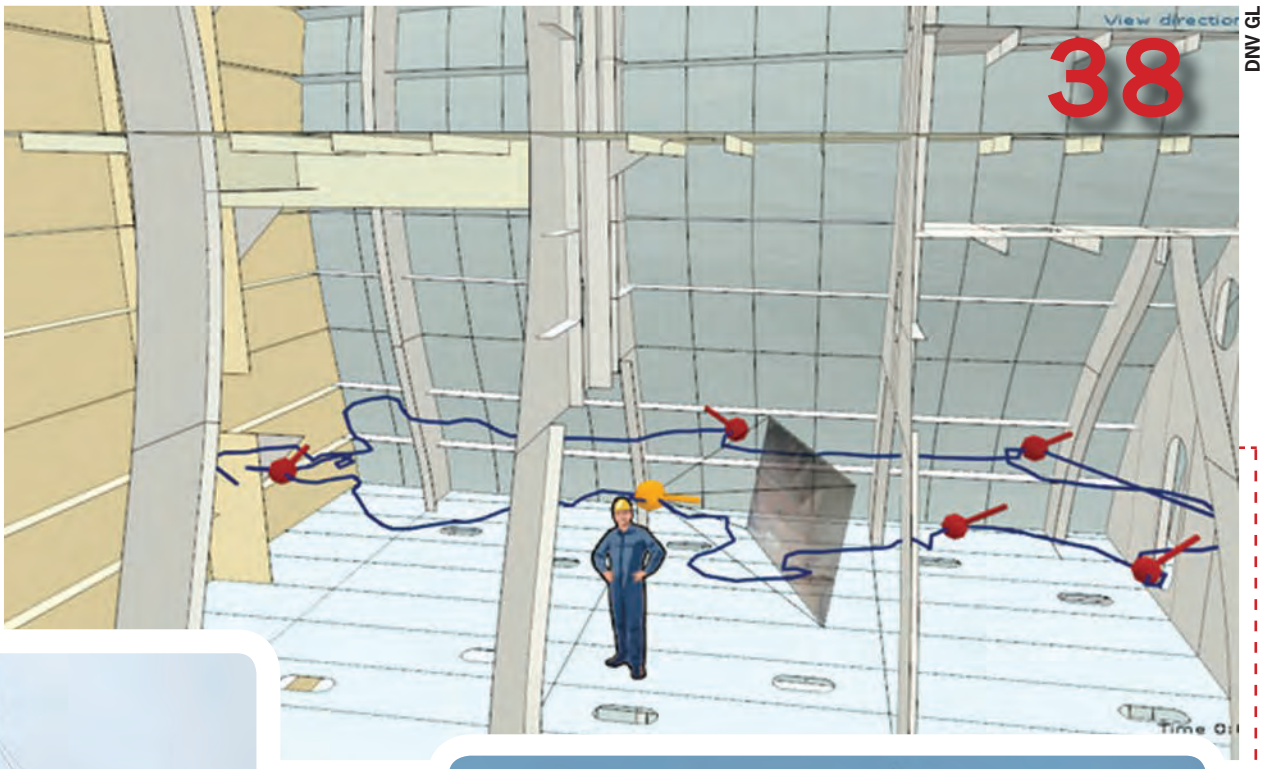

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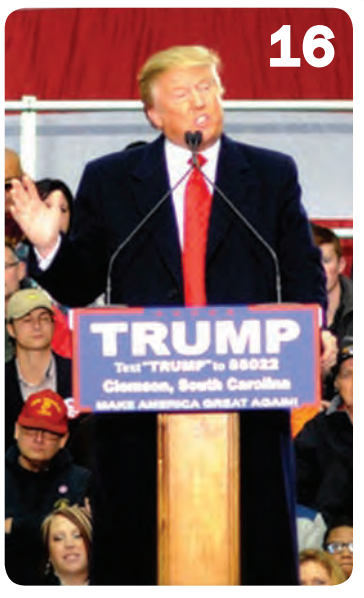
Credit Mike Zelt



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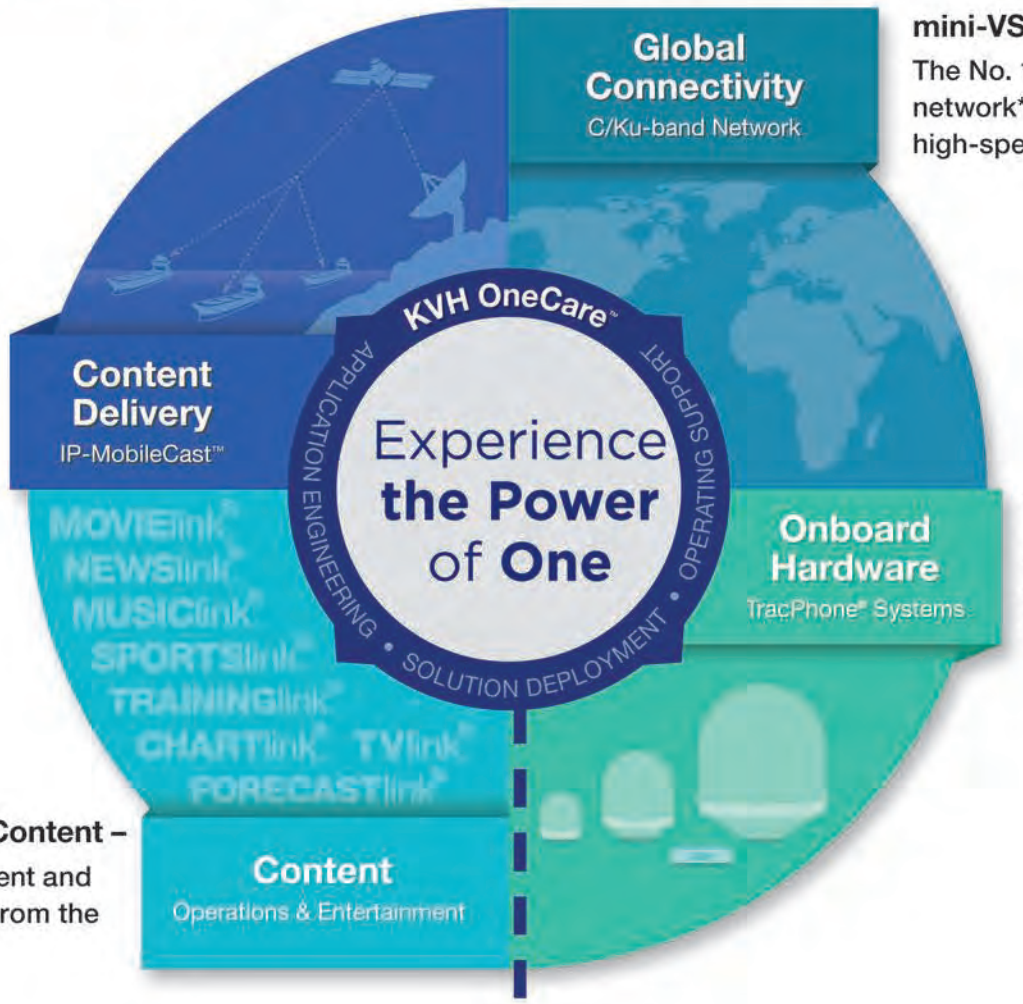

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Pictured on the cover is Seaspan Eagle from the ubiquitious marine design house of Robert Allan Limited's (RAL). RAL and many others are covered in-depth in our Workboat Design & Construction feature starting on page 50.

(Photo: Credit Mike Zelt)

The Commandant

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MARITIME REPORTER AND ENGINEERING NEWS
MARINELINK.COM

ISSN-0025-3448
USPS-016-750
No. 5 Vol. 78

Maritime Reporter/Engineering News (ISSN # 0025-3448) is published monthly (twelve issues) by Maritime Activity Reports, Inc., 118 East 25th St., New York, NY 10010-1062. Periodicals Postage Paid at New York, NY and additional mailing offices.

POSTMASTER: Send all UAA to CFS. NON-POSTAL AND MILITARY FACILITIES send address corrections to Maritime Reporter, 850 Montauk Hwy., #867, Bayport, NY 11705.

SUBSCRIPTION INFORMATION

In U.S.:
One full year (12 issues) $84.00; two years (24 issues) $125.00

Rest of the World:
One full year (12 issues) $110.00; two years $190.00 (24 issues) including postage and handling.

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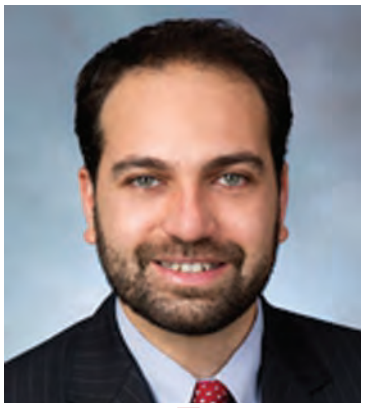

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GREG TRAUTHWEIN, EDITOR & ASSOCIATE PUBLISHER

Personally and professionally I have always considered myself a "glass half full" kind of guy. Optimistic perhaps to a point of annoyance to those personally closest to me, in business I've found this trait of assistance in evaluating the various forces that drive the maritime industries. Today, admittedly, it's hard to find optimism in any of the maritime niches. The tanker market stands strong, but the historical penchant for overbuilding when times are high has more than a few sounding warning bells. The cruise shipping industry is on a historic run, but in the grand scheme of global maritime it is miniscule.

Despite pervasive negativity, the overview 'silver lining' is the fact that the maritime industry remains the most economical and environmentally benign means to move massive quantities of stuff around the globe. It always has been, and always will be. That's not to say there will not be quantum leaps in technology and changes that will not significantly impact the market in general. Today, the best example is the increasing size of ships, which has not only impacted individual markets profoundly (ie. consolidation in the container sector), but has had significant ripple effects on the entire transport chain.

At the very core of much of this change you will find classification societies, and strictly by chance I had an unprecedented opportunity recently to interview at great length the leaders of ABS, ClassNK and DNV GL. Significantly during my journey to Sea Japan last month I was afforded the chance to interview the new chairman of and President of ClassNK, **Koichi Fujiwara**, in his Tokyo office. This 12-page feature starts on page 30, and while all of the conversations were separate, they all had a common thread: The Role of Data and Technology and the Evolution of Class.

I must admit that we have bandied about big headlines like "Big Data" recent and often, and I remember with distinction a feature that we published on the "Evolution in Class" in sister-publication Maritime Professional, primarily because we published an image of Charles Darwin on the front cover, one of my favorite covers of all time.

But the change happening in maritime and class today is truly transcendent, as the availability, analysis and utilization of data comes with the promise of making the business of moving commercial vessels more safe and seamless. Within class itself, technologies such as drones, HD video and data promises to fundamentally change the way in which the classification societies conduct their business.

Evolution is certainly not limited to commercial maritime, and in follow-up to our first sit-down in February 2015 with **Admiral Paul Zukunft**, Commandant, United States Coast Guard, the Commandant explains how the USCG itself is in the midst of a historic transformation, both in it procurement of physical assets and the recruitment and retention of people. No stone is left unturned, as Adm. Zukunft – starting on page 44 – weighs in on everything from Cyber Security to the procurement of some new heavy icebreakers, and everything in between.

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No Ballast Off Sinking Ships

The invasive species and ballast water treatment situation is dangerously close to spiraling out of control.

BY JOSEPH KEEFE

According to the web site **www.mpnballastwaterfacts.com**, the U.S. Coast Guard's announcement about the so-called "MPN method" has far reaching implications to the marine industry, particularly for shipowners and BWMS suppliers. And, while those two groups are, to be sure, facing tough decisions, I would suggest that the real loser here is the environment.

Old News

I've been covering ballast water and invasive species for a long time; as far back as 2000, actually. In 2002, the Commander of the Ninth Coast Guard District in Cleveland told me that "there was no more important issue on the plate of the U.S. Coast Guard." Industry got to work and over time, as many as 60 different manufacturers had developed a wide variety of technologies to combat the problem of invasive species, of which, about 50 had been approved by one flag state, classification society or similar organization. None here in the U.S., though. Almost 14 years later, I would argue that little progress has been made on the U.S. regulatory side.

Certainly, and particularly in the Great Lakes, back then, it was a hot topic and there was bitter debate over the issue. It was here that the Balkanization of the Ballast Water Treatment (BWT) regulatory process began. Myriad states, frustrated by the lack of federal action on the issue, made up their own laws. Vessels passing through the Great Lakes might pass in and out Canadian waters as many as 100 times, not to mention various U.S. states dozens of other times as they went about their business. It was nearly impossible to keep track of which law was in play at any one time.

Success! Or, maybe not …

Over time, the issue of invasive species has created its own little cottage industry, with trade shows, industry forums and all manners of meetings that promise knowledge, relief and a way forward. Over time, I attend as many of these as I can. One such conference, held on the West Coast some 16 months ago, finally crystallized the issue so perfectly that, as we await the long awaited IMO Convention to be ratified.

Sadly, I can't remember the gentleman's name who was giving the presentation, but it went something like this, and he said (paraphrasing): when we look at the ballast water treatment issue, the regulatory regime would have us believe that the systems are failing and that we haven't achieved success in battling invasive species. Actually, nothing could be further from the truth. We only need to look at how we measure success in other environmental efforts. Take engine emissions, for example. If we had by now eliminated 99 percent of all types of emissions from marine engines, then that would have been considered a wild success. Oil pollution? If we reduced oil spills by 99 percent, we might even get a pat on the back from the environmentalists. But, looking at BWT, we've achieved that metric, and more. And still, we have no approved systems in the United States. He went on to add that if we'd just installed these systems on every ship 10 years prior, we'd have all but solved the problem already. Or, at least, we'd have gone a long way towards the ultimate solution.

When he finished talking, the room was quiet for a minute, and I raised my hand, and asked, "Wait a minute – you're from California, right?" and, only when people had stopped laughing – obviously I was making reference to California's effort to (then) enforce a standard that mandated compliance to a rule that was 1000x the IMO standard – I continued, "Look, seriously, you reside in a state that is advocating compliance to a standard for which the technology does not exist to measure it, and yet you tell us we've largely succeeded, by any other benchmark?" And, when you get right down to it – that's exactly where we sit today.

My analysis of the situation isn't completely right. I'm told by folks in a position to know better, that comparing oil pollution and air emissions to ballast water isn't exactly an apple-to-apples discussion. I get it. But, if it is fair for the state of California to ask for a level of BWT compliance that can't yet be measured, then I think it is equally appropriate to allow the installation of current market equipment (without the fear of later disqualification of that equipment) to at least begin to attack the problems at hand.

The consortium's (well constructed) web site says that "On December 14, 2015, the USCG announced a preliminary decision not to approve four ballast water management systems that have been developed, extensively tested and known to be effective in eliminating the ability of aquatic invasive organisms from growing, colonizing and infesting U.S. waters. The basis given by the USCG for this preliminary decision is the USCG's interpretation of its own regulations to require ballast water management systems to be evaluated based on their ability to 'kill' certain organisms, and not to assess the 'viability' of organisms in ballast water to colonize after treatment. This interpretation is inconsistent with the USCG regulations and the statute under which the ballast water regulations are authorized."

The consortium goes on to say, "The MPN method is a well-established, sound scientific measurement method that has been utilized for decades to demonstrate effective organism neutralization. It measures the reproductive capability of organisms in water, and is relied upon by governing organizations throughout the world's highest risk water treatment applications, including drinking water, food & beverage, and pharmaceutical. UV treatment – utilizing reproductive measures like the MPN method – is trusted to protect the human health of over one billion people in the world, from New York City to Paris to Beijing." And then, it asks, "If UV treatment and the MPN method are used to protect human lives in the United States and throughout the world, why isn't it good enough for ballast water?"

Looking Ahead

I still go to trade shows of course – not just because I like the finger food at sponsored receptions – but also because it is important to stay abreast of what is going on in the real world. It is tempting to close your eyes to the noise surrounding BWT, if only because it has gone on for so long. That said; the invasive species issue is quickly coming to a head. In fact, at an industry event in New Orleans just last month, Glosten's Kevin Reynolds told a gathered audience, "We're in for a messy two years." I would have to agree with him.

Reynolds' remarks went to the impending ratification of the IMO Convention at a time when ANY type approvals from the U.S. Guard look anything but certain. When that happens, shipowners and manufacturers alike will find themselves in a tough bind. International vessel operators will be forced to comply and then also be faced with the prospect of 'non-compliance' in U.S. waters, where that island nation takes in 95% of what it consumes on blue water, registered traffic. What's a mother to do?

Compounding the situation, The U.S. Coast Guard's current position on equipment approvals potentially leave as many as 30 of the existing 50 'type-approved' systems out in the cold as the IMO ratification looms large in the proverbial porthole. And, some of our readers might say, "Well, that's just too bad." It certainly is. Especially when you consider that as many as 60,000 hulls may need BWT installation in the near term. The manufacturing capacity for the systems that remain – assuming they can also be approved – arguably does not exist.

By most accounts, the IMO Convention will be ratified during this calendar year. At last count, as many as 30 countries with 35 percent of the world's Gross Registered Tonnage (GRT) are required for passage and 49 countries comprising 34.8 percent GRT have already ratified the Convention. MarPro blogger Steve Candito of Foresea Consulting adds – in this very forum – a BWTS will probably be approved by the USCG in Q2 or Q3 2016. Even if that happens, I think it unlikely that one manufacturer will be able to satisfy all of the marine industry's BWT equipment demand.

As agonizingly slow as the BWT march to compliance has been over the course of the past 14 years, I think that pain will be nothing in comparison to the confusion that may be awaiting us just over the horizon. And I'm not just dumping 'ballast off a sinking ship.' That's because, in U.S. waters in any event, there is to date no approved equipment with which to legally do just that. Most stakeholders already know that this is as big a problem as we've seen on the regulatory front in the recent past. At the same time, I wonder when the U.S. Coast Guard will come to the same conclusion.

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LINCOLN ELECTRIC

Joseph Hughes

Chairman & CEO, The American Club

Photo Credit: The American Club

The American Club: "New Kid on the Block" Set to Celebrate a Century

As The American Club closes in on a historic milestone, Maritime Reporter & Engineering News met with its ubiquitous Chairman & CEO Joseph E. M. Hughes in his One Battery Park Plaza office for insights on the Club's recent evolution and future direction.

By Greg Trauthwein

"The international group is what I call the Bergdorf Goodman Syndrome. **Like Bergdorf Goodman, the International Group has a 'Gold Standard' of quality, service and financial integrity.** Under that gold standard roof are lots of individual gold standard retailers of varying sizes that have their own identities and their individual point of contacts."

The American Club is a third-party liability insurer – a Protection & Indemnity (P&I) club – founded 1917. While P&I clubs date back to the mid-1800s and the concept of 'mutuality' even further, Hughes said "We were founded relatively late in the day …. New kids on the block at nearly 100 years old."

Ultimately it was circumstance surrounding World War I that led to the emergence of The American Club, as the British insurers who had cover much of the U.S. fleet at the time became prohibited by an act of Parliament in England – the Trading with the Enemy Act – from insuring those parties that were still trading with the enemy (prior to the United States entering the war, some shipowners continued trading with Germany.)

"As a result, there was a large constituency of American tonnage that needed an alternative for their P&I cover," said Hughes. Enter Johnson and Higgins, leading marine insurance brokerage at the time in New York, who wrote to several American ship owners to gauge their interest in forming an American P&I club. In short, the answer was an emphatic 'yes,' and on Valentines day, February 14, 1917, The American Club was born.

"So the club was started in those rather interesting circumstances," said Hughes, "and was for the majority of its history solely and exclusively an American insurer. It never really looked beyond it's own shores, nor really did it have to; the American blue water fleet was substantial."

Changing Times

The evolution of the American fleet of cargo ships is well recorded. Vibrant through two world wars and beyond, it since (in the past four decades) has endured a steady and pronounced decline.

"By the early 1990s it was clear

"I think that all clubs will say generally that there is concern about the state of the shipping industry, **particularly the dry bulk sector, which is very bad to say the least.** I can remember the slump of the mid-80s, and I think most who can remember that would say that circumstances now are worse."

Photo Credit: The American Club

that unless there was a serious change in direction, The American Club was not viable going forward; it was simply too small; its outreach into the international market was virtually nil, and it needed to do something," said Hughes. And do something it did. Around 1993-94, an independent third party assessment of the club identified potential future directions for the club:

- kill it
- merge it
- change its direction completely, or
- build it up to compete with its European counterparts.

"Under the aegis of a plan called Vision 2000, they decided that they needed a new chief executive for the management company," said Hughes. "And so I, who was then working for a broking house in London, received a phone call from an old friend and asked me to come and run The American Club."

What Hughes found when he arrived in the mid-90s was a club with 27 members, an aggregate 3.4 million tons under cover, 95% of which was U.S. flag. "There was no international element to it, and rather narrow in its focus," is his blunt assessment. But change was the mantra, and he said "we have been in the mode of growth and diversification ever since."

That business today – business which includes P&I, charters and FD&D business combined (in 1995 the club did not have an FD&D division or charters business) is 22 million gross tons. Globally The American Club employs 80 people with 50 in New York. "We're not huge, but we're not insubstantial either."

While the change has been dramatic, Hughes contends that there are some central characteristics that remain. "It is most the same in the sense that it has a solid bedrock of U.S. business; the U.S. business is still at the core, it is our pride and our tradition, and I think it reflects the 'can do' instincts of The American Club's homeland," Hughes said. "The difference is a difference of scale, a difference of product line a difference of a much broader skill set and a much more broad, global reach. Back in 1995 we had only one office and that was here in New York." Since then it has opened an office in London, Piraeus, Shanghai, Hong Kong, Dalian and it will shortly open an office in Houston. "Our global reach is now equal that of our somewhat larger competitors."

Another big difference is the fact that the American Club is now a full member into the International Group of P&I clubs. It was not a member in any capacity until 1989, when it became a reinsured member. Gaining membership was a top priority for Hughes when he joined the club more than two decades ago. "It was vital to us strategically to get the benefit of the pooling agreement, and it was very high on my agenda when I arrived here in 1995 to get full membership. That was a fairly demanding process that effectively took 2.5 years," a process completed when the club officially joined on February 20, 1998.

Competing for Business

The competitive nature of the P&I business is interesting, as a hallmark of business competition – price – is essentially eliminated based on the manner in which the clubs work, independently and communally. "The international club cooperates immensely on a number of levels; soft benefits in its dealings with the IMO, for example, as well as in a hard sense by reference to their reinsurance arrangements," said Hughes. But in consideration of preserving this "consumer collective" a new club cannot quote less than the holding club's rate upon renewal, a minimum degree of restriction "necessary to preserve the community of interest and conviviality among clubs so that they can continue to cooperate in every other respect."

While they are not competing on price, make no mistake there is spirited competition. Hughes explains that while The American Club is active in Asia, it does not have business in Japan, where the Japan club and two or three large clubs dominate. "They have been there for generations, and they have a certain cache and position in the market that we would find difficult to replicate." He terms the American Club more geared toward the middle market, contending that similarly, some of the larger clubs would find its position in Greece – working with smaller owners with smaller fleets – difficult to replicate. "Also, the U.S. tug and barge and Jones Act business is something we know very well given our domicile," and other clubs either don't know it or are not interested in it.

"The international group is what I call the Bergdorf Goodman Syndrome," Hughes explains. "Like Bergdorf Goodman, the International Group has a 'Gold Standard' of quality, service and financial integrity. Under that gold standard roof are lots of individual gold standard

retailers of varying sizes that have their own identities and their individual point of contacts. The shipping world itself is immensely fragmented, with an enormous range of different types of operations and preferences. That's really how we compete."

The Path Ahead

The American Club is not immune to market conditions, and "one of the drivers is the state of the shipping markets generally, specifically the volume of tonnage of certain sectors, and the volume of premium reflecting on the appetite of owners and their ability to pay the premium," said Hughes. "I think that all clubs will say generally that there is concern about the state of the shipping industry, particularly the dry bulk sector, which is very bad to say the least. I can remember the slump of the mid-80s, and I think most people who can remember that would say that circumstances now are even worse."

But even in a down market there is opportunity to be had, particularly for the 'new kids on the block.' "We see opportunity in the world that are still relatively buoyant; Greece still boasts a significant global shipping community. Also, regionally, we continue to have a significant presence and business in Asia, both north and southeast Asia," said Hughes. "Two or three years ago as the crisis in the dry bulk sector was evolving, we probably had more dry bulk tonnage in the club than tanker tonnage. That situation has reversed itself, because our owners overseas are tending to take more tanker tonnage, and there is a scrapping of older dry bulk tonnage."

Similarly The American Club listens to the industry in the creation of new products. One of its most notable introductions five years ago was a fixed-premium P&I product called Eagle Ocean Marine. As Hughes explains, essentially this provides P&I and FD&D to the operators of smaller vessels, smaller vessels typically in regional and local trade, that don't want or need the very large limits of liability (or exposure to supplementary cause) that are typically provided by the group clubs under the pooling agreement. As a point of comparison, he said that P&I clubs care for about 90% of global, oceangoing fleets, while 10% is fixed premium.

Innovation of product and service is the key to continued success, as Hughes maintains that "you can never rest on your laurels; you've got to keep going, but you've got to keep going prudently as well. The other concern that you have in just taking business willy nilly is that it brings a disproportionate amount of claims exposure. Happily, we have been successful in keeping our claims exposure suitably low."

Another challenge is the level of political intervention, such as 'sanctions,' as well as political intervention in terms of political responses to major casualties, such as Prestige, the Erika, the Costa Concordia. "This has changed the dynamic considerably," Hughes said, and "the politicization of major maritime accidents is far greater than it was 30 years ago."

Still, Hughes and his team remain focused on continuing The American Club's growth for the coming generation. "We do think it's vitally important within the totality of the P&I world, which is largely Euro-centric, that there should be a strong and flourishing American Club because it is a part of the natural scheme of things in terms of the world economic order."

The U.S. Election

Evaluating the Ramifications for Maritime

(Source: DonaldJTrump.com)

Trump

Donald Trump has indicated mild support for the end of the (Iran) embargo, while characteristically noting that he would have "made a better deal."

Clinton

Hillary Clinton is expected to make containing Iran one of her central foreign policy objectives. "Iran is still violating UN Security Council resolutions with its ballistic missile program, which should be met with new sanctions designations and firm resolve."

(Official portrait. Photo: U.S. Department of State)

A proverb common to both Greek and Turkish cultures states that a wolf may change its fur, but does not change its nature (Ο λύκος την τρίχα αλλάζει, το χούι δεν τ`αλλάζει /Kurt tüyünü değiştirir, huyunu değiştirmez). In English, we might render this "a leopard cannot change its spots." If we are to believe the proverb, looking at early statements and platforms of the 2016 presidential candidates can provide valuable insight to the next president's policies. The maritime industry is impacted by foreign affairs to a greater degree than many industries worldwide. What is certain is that the global maritime industry, particularly the many companies operating in Greece and Turkey, will be impacted by the policies of the next president of the United States. Understanding the "nature" of these candidates through their early policies and statements will allow companies to manage risk and properly make any necessary changes to operations before political change can impact a company's bottom line.

Sanctions

Iran Sanctions

The majority of candidates take a harder view on Iran sanctions than the Obama Administration, which raises the risk that Iran sanctions will impact the maritime industry in 2017. This risk could be particularly poignant in the Eastern Mediterranean, where Greek and Turkish companies are in a prime position to capitalize on Iran's "reopening."

Hillary Clinton is expected to make containing Iran one of her central foreign policy objectives. Indeed, she has stated that "Iran is still violating UN Security Council resolutions with its ballistic missile program, which should be met with new sanctions designations and firm resolve." In a recent debate, Secretary Clinton stated that the normalization of relations with Iran "would remove one of the biggest pieces of leverage we have to try to influence and change Iranian behavior." These statements demonstrate that while Secretary Clinton views the current Iran deal as a starting point, she has postured herself as more of a hardliner on Iran than President Obama.

Donald Trump's views on Iran have wavered and changed over time. Although Mr. Trump initially signaled mild support for the Iran deal (suggesting he would "police" it), he has recently changed his approach, claiming now that he seeks to "dismantle" the Iran deal.

Governor John Kasich has taken a nuanced view of the deal. While he is on the record opposing the deal, he has also signaled that enforcement of the current deal may be preferable to new sanctions.

The other candidates' views of the Iran deal fall in line with their general political trajectory. Senator Bernie Sanders supports President Obama's policy and views diplomacy and engagement as the best means to achieve a nuclear-free Iran. Senator Ted Cruz has compared the Iran deal to the policy of appeasement in the 1930s and has promised to "rip up" the Iran deal. Given this political uncertainty, companies should be prepared to "snap back" appropriate sanctions management techniques by early 2017.

Cuba Sanctions

Rapprochement with Cuba has been another key piece of the Obama Administration's foreign policy, the culmination of which will allow companies worldwide to trade with both Cuba and the U.S. without penalty. The Democratic Party candidates generally support the continuation of these policies.

The Republican Party candidates generally take a hard line on Cuba. The Republican Party itself has called for both the "dynastic succession of power within the Castro family" and "the legalization of political parties, an independent media, and free and fair internationally-supervised elections" as prerequisites for the rollback of U.S. sanctions. However, Donald Trump has indicated mild support for the end of the embargo, while characteristically noting that he would have "made a better deal." John Kasich has called the deal a "mistake," while Senator Cruz (who is of Cuban descent) has publicly admonished the Obama administration for its policies and has closely tacked his party's Cuba policy.

Other Sanctions

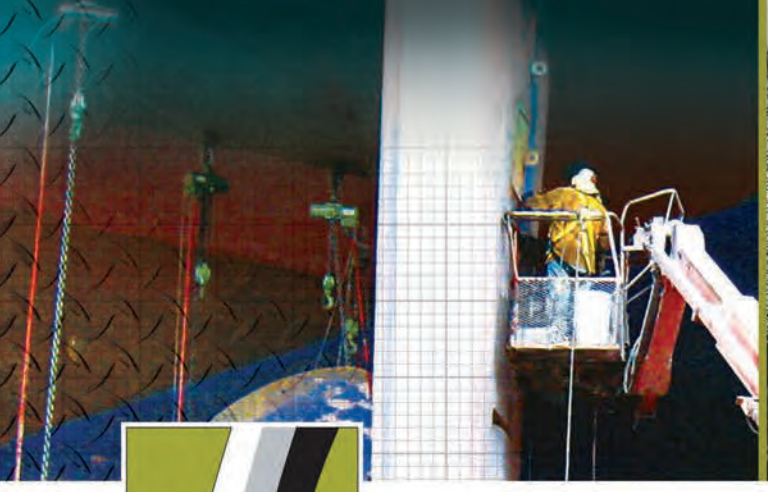
Candidates from both sides of the aisle have ignored other U.S. sanctions programs during the campaign. As Secretary of State, Hillary Clinton promoted democracy in Myanmar and planned intervention in Libya, which could signal that her administration will support the current sanctions in each country. But, Senator Sanders opposed Libyan sanctions, indicating that the Libyan market could be further open to Greek and Turkish carriers should Mr. Sanders win.

Geopolitical Issues

The maritime industry is impacted by foreign affairs to a greater degree than many industries worldwide. Greek and Turkish companies operate in a geopolitical neighborhood, which presents unique challenges and business opportunities that the next President will impact.

Cyprus

Cyprus presents opportunity for both Greek and Turkish maritime companies, both in terms of carriage of goods to and from Cypriot ports as well as the potential development of offshore resources. Although a major regional issue, Cyprus has received scant attention in either the Obama Administration or during the primary campaign. Secretary Clinton is the only candidate with a track record on Cyprus; in 2011, she called for a "bizonal, bi-communal federation" on the island. The lack of positions signal that the United States will likely continue to pay little attention to efforts to reunify the island.



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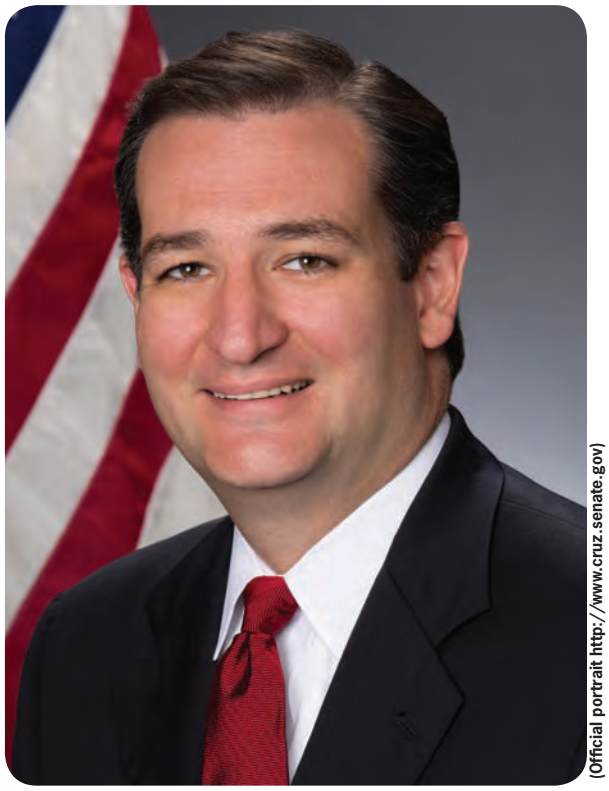


(Official portrait http://www.cruz.senate.gov)

Cruz

Senator Ted Cruz' free-market oriented policies may conflict with the legislative intent of the Jones Act.

(Official Portrait http://www.sanders.senate.gov)

Sanders

Senator Bernie Sanders supports President Obama's policy and views diplomacy and engagement as the best means to achieve a nuclear-free Iran.

(Official portrait http://www.governor.ohio.gov)

Kasich

John Kasich is the only candidate who has consistently supported free trade, although he has made protecting American jobs a priority.

KRG

The status of the Kurdistan Regional Government (KRG) within Iraq or as a separate entity could impact Greek and Turkish maritime interests. The example of the M/T United Kalavryta crystallizes this reality. The M/T United Kalavryta is a Greek managed ship that loaded one million barrels of KRG-origin oil from the port of Ceyhan in Turkey. The oil aboard the United Kalavryta sat off the coast of Houston, Texas, and was subject to litigation between Iraq and the KRG.

While none of the candidates have directly addressed the status of the KRG, almost all the candidates have expressed support for the KRG's peshmerga forces. Hillary Clinton and Donald Trump have even argued arming the peshmerga directly instead of through the central government in Baghdad. This may signal that the two leading candidates see the KRG as an entity distinct from Iraq.

South China Sea

The South China Sea's disputed maritime claims have caused international tension in an area where more than half of the world's international trade transits. Escalation of these disagreements escalate may hamper the free movement of goods by sea and impact the bottom line of many maritime companies, particularly those with a global reach like in those Turkey and Greece. With the exception of Secretary Clinton, none of the candidates have formulated a coherent policy on the South China Sea issue, and it is difficult to predict the stance that the next U.S. administration will take on this issue.

Trade

Jones Act

In the United States, there is a saying that the only things certain in life are death and taxes. It may be prudent to add the Jones Act to this list. Although the president has some power to enforce and make changes to the implementation of the Jones Act, the power to modify or repeal the Jones Act lies solely with the U.S. Congress, which is unlikely to exercise this power.

Secretary Clinton has publicly expressed support for the Jones Act and has the endorsement of the Seafarers International Union, which supports the Jones Act. Additionally, the leading candidates hold policy positions in line with the Jones Act, particularly in terms of supporting American jobs.

Senator Ted Cruz may be an exception as his free-market oriented policies may conflict with the legislative intent of the Jones Act. Two think tanks that are ideologically similar to Senator Cruz, the Heritage Foundation and the Cato Institute, have called for the repeal of the Jones Act. However, even if Senator Cruz were to ascend to the presidency, it remains impossible to conceive that Congress would repeal the Jones Act. Greek and Turkish companies are thus not likely to see any change in the ways they can serve the U.S. market.

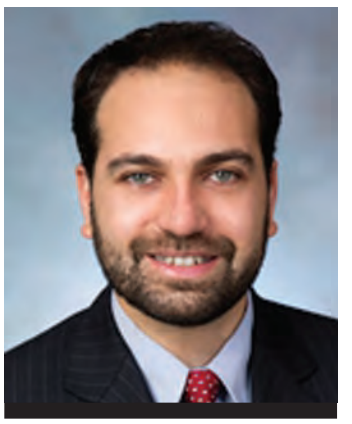
Support for Free Trade Agreements

Free trade has the potential to increase the movement of goods and services worldwide, which could mean an increase in shipping demand. However, free trade has been a difficult sell in this election cycle. Most of the leading candidates have opposed free trade agreements such as the TPP and TTIP, and even disparaged longstanding agreements like NAFTA. Even Secretary Clinton, who was involved in the negotiations of free trade agreements, has adopted a more negative tone on free trade. John Kasich is the only candidate who has consistently supported free trade, although he has made protecting American jobs a priority.

These positions do not bode well for an increase of trade under the next administration. More concerning for the global maritime industry, it may signal a future decrease in demand in one of the world's largest consumers of imported goods.

Conclusion

The past decade has been fraught with peril for the maritime industry, both in terms of business cycles and government oversight. As another proverb reminds us, using language common to both sides of the Aegean, "dert (ντέρτι) gitmez, değişir" (problems do not leave, they change). Taking prophylactic actions based on the "nature" and positions of the candidates can ensure that any "problems" created by the next administration remain only surmountable challenges.



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Roulakis would like to thank Blank Rome Associate Kierstan Carlson and Erik Lowe for their assistance with this article.

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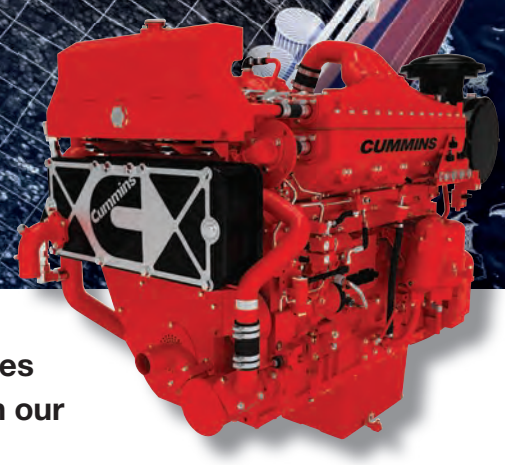

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Automated Skill Erosion

The increasing automation of vessels is causing some mariners to lose basic maritime skills.

DENNIS BRYANT

(U.S. Navy photo by Mass Communication Specialist 3rd Class Travis K. Mendoza/Released).

The U.S. Naval Academy at Annapolis in 2015 reinstituted a course of instruction in celestial navigation after abandoning it a number of years ago. Senior Chief Quarter Master Jonathan Myers teaches Command Master Chief April Beldo how to use a marine sextant during a demonstration of celestial navigation aboard the aircraft carrier USS Carl Vinson (CVN 70).

Cruise ship Royal Majesty Grounding

During dinner on June 10, 1995, the last night before the cruise ship Royal Majesty was due to arrive in Boston from its voyage to Bermuda, the master bragged to the passengers at his table that his ship could never run aground because it had all the latest electronic equipment, including a navigation system that integrated the GPS signals and other information. At 2225 that night the ship grounded on the Rose and Crown Shoal near Nantucket. It was 17 miles west of its planned trackline. There were no deaths or injuries as a result of this grounding on a charted and marked shoal, but the ship incurred about $7 million in damages. The cause of the casualty was overreliance by the deck watch officers on the automated features of the ship's integrated navigation system, located on the bridge. The GPS receiver with its warning light to show when signal reception was interrupted, was located in the chart room, which was seldom visited when the ship was at sea. The wire connecting the antenna to the GPS receiver had come loose, ending reception of the signal. The warning light continuously flashed, showing that system had defaulted to its dead-reckoning mode (which did not account for current and winds). The ship was gradually pushed west of its intended track due to the current and winds, but this was not reflected by the integrated navigation system.

The ship's fathometer was operating properly, but not monitored. The fathometer alarm was not switched from its in-port mode of zero-fathoms to its at-sea mode of three-fathoms. As a result, the fathometer alarm did not sound prior to the grounding.

The ship was equipped with a Loran-C receiver, which was operating properly and would have warned the watch officer that they were off course and headed into shoal water. The watch officers' practice, though, was to check the Loran-C only if they knew that the GPS receiver was inoperable. Thus, no one read the position on the Loran-C receiver from the Bermuda departure until the grounding.

A buoy was seen on radar and assumed to be one that marked the entrance to the traffic lanes, but never identified. A second buoy marking the traffic lanes that should have been seen if the ship were on course was not seen, but its absence was ignored. Lookouts reported several high red lights (subsequently determined to be on Nantucket Island) and, later, white water ahead, but the watch officer took no action.

The radar, set for six miles, would have detected Nantucket Island if set on the twelve mile range, but this was not done. There is also no evidence that celestial navigation was used at any time during this voyage.

In other words, the watch officers relied solely on one source of position information for navigation, even though multiple sources were readily available. GPS had become so good and so convenient that everything else, including the warning of white water ahead, was ignored.

Other Technology-Assisted Casualties

One would have thought that lessons learned from the Royal Majesty casualty would have been fully absorbed by the marine industry, thus avoiding similar incidents in the future. Not so! Following are just a few incidents where modern maritime technology has led mariners astray.

On March 16, 2011, the bulk carrier MS Oliva grounded at full sea speed on Nightingale Island (a small island off Tristan da Cunha) in the South Atlantic. The ship was enroute from Brazil to China with a cargo of 65,000 tons of soya beans. The ship also had on board about 1,700 tons of fuel oil. An error was made during the passage planning as a result of which the trackline set in the integrated navigation system ran through the small island. No one checked the passage plan in detail. The watch officer saw clouds ahead, but assumed that it was typical weather. It turned out to be clouds around the mountain on the island. The radar showed a target dead ahead, but the watch officer assumed that it was clouds. Unfortunately, the target was Nightingale Island. The grounding broke the ship in two, spilling the cargo and the bunkers. Fortunately, there were no deaths or serious injuries, but the island is a designated important bird area, with many endemic species. The local Rockhopper penguin population and nu-

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merous seabirds were adversely affected by the oil spill. The passage plan had, unfortunately, worked perfectly.

On October 4, 2011, the containership Rena grounded at full sea speed on the charted Astrolabe Reef while en route Tauranga, New Zealand. The ship was running late and the second mate intentionally set a course within one mile of the reef so as to shorten the voyage. Neither the second mate nor the master, who had taken over the conning of the ship, was monitoring the ship's actual position. Both radar and depth sounder were installed and operational, but not relied upon during the time leading up to the grounding. The ship's routine practice was to chart the position once each hour on the hour. At 0200, shortly prior to the grounding, the AB obtained the ship's position from the GPS receiver, but was unable to transfer it to the chart because the master and the second mate were standing in front of the chart table. The ship's radar was equipped with automatic radar plotting aid (ARPA) capability, which would have allowed the reef to be added as a navigation hazard, but this was not done. The GPS information was not integrated into the ship's radar, the two systems operating independently. The second mate did not use GPS or parallel indexing to monitor the progress of the ship as it neared the reef. The compass error of the ship's gyrocompass was not checked at any time during the voyage. The reef was not marked by a beacon or buoy, but it was near land and well charted. The navigating officer intentionally sailed the ship to pass close aboard the reef, but did not account for wind, current and compass error, relying almost completely on the ship's autopilot.

On February 26, 2013, the general cargo ship Douwent grounded on Haisborough Sand in the North Sea. Investigation revealed that the ship was following the navigation track displayed on the GPS receiver and on the radar. An undetected passage planning error had resulted in an erroneous waypoint to be entered in the trackline. Although the ship's other systems, including radar, fathometer, and paper charts, were in order, sole reliance for navigation was placed on the electronic passage plan.

The US Naval Academy at Annapolis in 2015 reinstituted a course of instruction in celestial navigation after abandoning it a number of years ago.

Aviation

A recent study of the impact of automation on aviation safety reached some disturbing conclusions. While increased automation was expected to reduce workload, freeing the crew to perform more complex tasks, it found that most workload reductions occur when workloads are already low, as in mid-flight. The reduced workload seems to create a trend toward lack of vigilance and even boredom among the crews of highly automated aircraft. Automated systems can actually increase crew activity during higher crew workload phases, such as takeoff and landing, distracting the pilots from critical vigilance for outside traffic and situational awareness.

Aircraft automation has also caused a degradation of basic piloting skills. A recent airline crash in Southeast Asia was blamed in part on the inability of the pilots to effectively fly the plane manually after failure of the automated system. On June 1, 2009, Air France Flight 447 crashed into the South Atlantic off Brazil killing all 228 persons on board. Investigation concluded that there had been temporary inconsistencies between airspeed measurements (likely due to the pitot tubes being obstructed by ice) causing the autopilot to disconnect. The pilots reacted incorrectly, putting the aircraft into an aerodynamic stall from which it did not recover.

In April 2015, dozens of American Airlines flights were grounded when a glitch caused the iPad software used by pilots and co-pilots to view their flight plans to stop working. At least one pilot, though, went back into the terminal, printed out paper copies of the flight plan and route, and then flew his aircraft the old-fashioned way to its destination. The other pilots waited with their planes and passengers on the tarmac several hours until the software glitch had been resolved. I, for one, would be more comfortable flying with a pilot who still knows how to fly without computer assistance.

Conclusion

The master of a ship, and consequently, the owner of that ship, is required to utilize all available means of navigation that will provide useful information. Just because satellite navigation is the most convenient means (and, in many circumstances, the most accurate) the master may be found negligent, and the vessel possibly unseaworthy, if that master does not require the deck watch officers to routinely check the radar, fathometer, and other means of navigation, as well as maintaining a good lookout. As a federal appellate judge ruled in 1960: "A master has no more discretion to disregard this [means of] navigation than he has to disregard the use of charts, current tables and soundings where the circumstances require the use thereof." Along the same lines, a noted British admiralty judge opined: "[T]he primary instruments for safe navigation must remain an alert and systematic visual and radar lookout."

The only way by which a deck officer can be expected to be proficient at the use of radar, piloting, celestial navigation, and other means of navigation is for those skills to be routinely practiced. Over-reliance on satellite navigation will inevitably lead to deterioration of the other skills and, more importantly, may result in a failure to become aware when the satellite navigation system is not working properly.

Use it or lose it!

The Author

Dennis L. Bryant is with Maritime Regulatory Consulting, and a regular contributor to Maritime Reporter & Engineering News as well as online at MaritimeProfessional.com.

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Driven by the SOLAS-mandated transition to ECDIS, the adoption of digital navigation is the most visible sign of how navigational practices are being transformed. Additional tools are also playing an important role in supporting bridge teams and delivering accurate navigational information to the bridge.

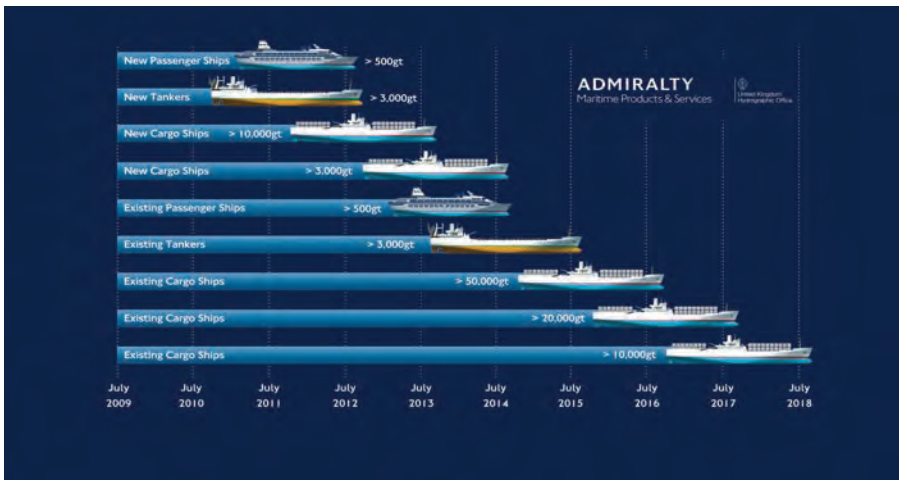
The ECDIS Tipping Point

We are now halfway through the transition period under the timetable set out in the amendments to the SOLAS Convention adopted in 2009, requiring the mandatory carriage of ECDIS for ships engaged on international voyages. This timetable put in place a series of deadlines for different vessel sizes and classes.

The shipping industry has now reached a pivotal landmark in this process, with UKHO data revealing that over half of ships trading internationally are now living with ECDIS. Of an estimated 41,500 internationally trading ships around the world, almost two thirds subscribe to an ENC service. When those that do not trade internationally are included, 45% of all ships that are subject to the SOLAS regulations are ECDIS ready.

Why does this matter? For the first time, vessels without an ENC service now represent a minority of the internationally trading fleet. This is an important tipping point, as it signals that we are moving out of the ECDIS adoption phase and into a new era. On the basis of this positive trajectory for ECDIS adoption, it also looks as though the shipping industry is on course to comply with the SOLAS-mandated timetable for ECDIS carriage across the global fleet by the end of this decade.

It is also encouraging to see that positive progress towards ECDIS adoption is being made by different categories of ship types and sizes. The proportion of tankers over 3,000 gt using an ENC service has risen from 54% in April 2015 to 69% in October 2015, following the ECDIS carriage rules that entered into force for tankers from July 2015.



The picture is even more encouraging for existing cargo ships over 50,000 gt. At present, 62% of these 3,500 large cargo ships are using an ENC service, ahead of the July 2016 deadline when the SOLAS regulations on ECDIS carriage will be extended to these ships. This is well ahead of where the tanker fleet stood 12 months ago; indicating that the cargo ship fleet is more advanced in its preparations. There are also some interesting variances in ECDIS readiness between different categories of cargo ship. At present, 57% of bulkers are living with ECDIS, compared to 65% of RoRos and 71% of containerships.

This is more than a symbolic landmark. To put it simply, it means that digital navigation isn't just the future. Today, digital navigation is a reality.

This has an important implication for everyone in the ECDIS supply chain, including ECDIS manufacturers, training providers, shipping companies and mariners. In the past few years, the conversation has been dominated by discussions about how to make the transition to ECDIS, but now we need to spend more time talking about living with ECDIS; how we use, manage and properly maintain digital navigation systems.

Updating ECDIS Software

For ship owners navigating digitally, the focus of their attention must now shift towards the ongoing management and maintenance of ECDIS on a day-to-day basis. It's vital to understand that ECDIS compliance, and effective ECDIS use, are not the same thing. To begin with, shipping companies must ensure that they put in place revised bridge policies and procedures that reflect the requirements of safe, effective and compliant ECDIS operation. A further priority is the need to upgrade ECDIS software to comply with the latest IHO ENC Standards. Last summer, in response to feedback from mariners, the International Hydrographic Organization (IHO) unveiled a series of important updates to the technical standards that govern the display of Electronic Navigational Charts (ENCs) within an ECDIS.

These updates include a revised Presentation Library within 'S-52'; the standard that governs the portrayal of an ENC on an ECDIS screen. The latest Presentation Library (version 4.0) addresses the number one complaint levelled at ECDIS by mariners: constant audible alarms. By providing clear guidance to ECDIS manufacturers on ENC objects that will raise an alarm, the IHO has tackled the issue of alarm fatigue on the bridge. In addition, information such as fairway and anchorage area names now appear on screen, with landmarks, lights and buoys viewable via a 'hover-over' function. Both initiatives reduce the time-consuming need to find information buried in a pick report.

We strongly encourage all owners to contact their ECDIS manufacturer and plan early for the transition to the updated ECDIS Standards, in order to ensure a smooth switchover and to take advantage of the benefits that the new editions will bring to the bridge.

Nautical Publications Go Digital

Of course, ECDIS is not the only new navigational tool available to mariners. New passage planning resources are equipping bridge teams with faster, more efficient and accurate navigational information. A wide range of official ADMIRALTY nautical publications are now available in an electronic format as e-Nautical Publications (e-NPs). They are designed to meet SOLAS carriage requirements, contain the same information as their paper equivalents and are approved for use by the Flag States of over three-quarters of ships trading internationally.

Unlike their paper counterparts, each e-NP allows bridge officers to download and apply weekly Notices to Mariners (NM) updates in just a few seconds, freeing up their time to focus on other tasks and ensuring greater accuracy on board. Additionally, the new e-Reader snapshot function allows crews to view, save and print e-NP pages and any applicable NMs and addendums, which can be used to support passage planning. Sailing Directions, the Nautical Almanac and the Mariners Handbook are just a few of the publications now available as e-NPs.

Conclusion

The shipping world is embracing digital navigation with growing familiarity and confidence. For shipping companies that have installed ECDIS across their fleet and for mariners now serving on ECDIS-equipped ships, the new challenge is to develop and implement the practices and procedures that will enable them to realize the full benefits for safe and efficient navigation.

The Author

Thomas Mellor is Head of OEM Technical Support and Digital Standards at the United Kingdom Hydrographic Office and Chairman of the IHO's ENC Working Group.

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Navico Makes its Commercial Push

Marine electronics group Navico, a literal 'house of brands' for the recreational, sail, power and commercial marine markets, is making a strong push in the commercial sector with its Simrad brand. Armed with a stockpile of new technology and a global network of sales and support, Christian Olsson, VP Commerical Marine, Americas, and Mike Fargo, Global Product Line Director, explain how this 'David' aims to take on the commercial marine electronic 'Goliaths.'

By Greg Trauthwein

The ascension of Navico in recreational marine electronics business – an estimated $1 billion market globally – was fast and furious, growing from roughly 7% of the global market in 2005 to nearly 30% in 2007, standing steady at about 35% today, fueled by a strategy built on the acquisition of strong brands mixed with organic growth. While today roughly 70% of its $400m in annual revenue still comes from its recreational business, Navico is doubling down on its efforts to the commercial marine electronics market, which on the hardware side is measurably larger at an estimated $2.5 billion annually, not to mention the value of the fast-growing 'digital marine' services sector which, in the end, could dwarf the hardware side of the business.

The Commercial Push

"The owners of our company realized that there was room for growth (in the recreation side), but growth from a leading position is a particular challenge, and it takes a lot of money," said Mike Fargo, Global Product Line Director – responsible for commercial product line. "Looking at the commercial space three years ago, it was realized that we have room for growth. So the challenge to the management team was to double (the size of our business) in five years time," and commercial was the natural space.

An initial glance into the commercial marine electronic business and Navico saw a fragmented market with many vendors. So it set about its business of consolidation, with the realization that it needed to add several core competencies to be considered a serious contender in the commercial space. It's acquisition of Consilium was arguably its first major move toward the commercial sector, as its customers were saying "you need to be serious about radar in the commercial market," said Fargo. "With The Argus Radars, Category 1 and Category 2 radars, the biggest segment (served) are merchant and IMO classed vessels. So it was a product acquisition, it was a market acquisition, and it was a relevance to customers."

Next on the 'to do' list was ECDIS, particularly with the looming requirement regarding the installation of of ECDIS aboard commercial ships. "The MARIS acquisition was a strategic one in terms of taking on an innovative supplier with an installation base of about 8,000 ships," said Fargo. "Again, with the MARIS acquisition we achieved product growth, market growth (into bigger ships); and relevance growth."

But ECDIS in and of itself was not the only end-game with the MARIS acquisition, as the technology came with the ability to distribute charts, which tied in neatly with Navico's Digital Marine Division strategy, said Olsson. "Digital Marine could be so many things, a total market that could be tens of billions of dollars." The Chart side of the ECDIS business fit into this well and immediately, as the company became a direct UKHO distributor of new charts and updated charts.

While the "House of Brands" strategy offers many strengths in diversity of technology, talent and share of market, it also comes with challenges in the form of customer confusion, product and service overlap, and generally the ability to concisely explain the depth, breadth

and capability of the company. “Simrad is our heritage, as it is the oldest of our brands, but it is also our future on the commercial side,” Olsson said.

The Simrad Brand

While the commercial side of its business is small when compared to the recreational business, one of its strongest brands – Simrad – has a long, storied history. Beginning in 1946 with Thorleif Robertson, the founder of auto-steering in Egersund, and in 1947 with Willy Simonsen in Oslo, the founder of Simonsen Radio. The two companies later became Simrad. Simrad is the union of a number of companies that in their time were ground-breakers in their areas of technology. That legacy is carried forward today, as Navico introduces several new innovative product lines … from the Simrad ECDIS E5024 to the Simrad HALO Pulse Compression Radar … all geared toward earning Navico a top-three spot in the fraternity of commercial marine electronics suppliers in the coming few years. In early March 2016 the quest for a stronger commercial entity

Halo Radar

The Simrad Halo Radar is a pinnacle achievement for its maker, touted as revolutionary and endorsed with several international awards. The Simrad HALO Pulse Compression Radar is touted as the world’s first high-performance recreational solid-state, open-array radar system with pulse compression technology. The HALO Radar combines the advantages of Broadband Radar and traditional pulse radar systems – providing navigational visibility and awareness as close as 20 ft. (6 m) within the pulse radar’s short-range “blind spot,” where once only Broadband Radar could operate – all while offering exceptional long-range performance up to 72 nautical miles.

With Beam Sharpening for enhanced target separation control, HALO Radar provides top target resolution. Using its Dual Range mode, HALO can also function as two radars in one with no signal loss, monitoring two distance ranges simultaneously with independent display controls. Designed to be simple to use custom Harbor, Offshore, Weather and Bird (to help locate feeding game fish) modes, tune HALO Radar’s advanced signal processing to ensure targets are seen vividly, even in the toughest environments. Dual Range mode also allows dual MARPA target tracking where up to 20 targets are displayed, indicating the closest point of approach and time to closest point of approach.

HALO’s solid-state technology is designed to produce a crystal-clear, accurate radar image instantly from standby or in 16 to 25 seconds from power-up. HALO Radar is safe to use and already meets upcoming low emission standards and with its low power consumption, support for 12/24-volt systems and availability in 3-, 4- and 6-ft. open arrays.

Simrad Pro R30

made another significant stride when it was announced that Jeppesen, a part of Boeing Commercial Aviation Services, had reached an agreement to sell its marine business to Digital Marine Solutions, which is owned by the Altor 2003 Fund, which is part of the Nordic based Altor family of private equity funds which owns Navico. As anyone in the maritime business can attest, proclaiming yourself a market leader is one thing; become a market leader another. Though its formula for success is undeniable on the recreational side of the marine electronics business, it realized that achieving its goal of doubling its business and cracking the 'top 3' of commercial marine electronics suppliers required fresh thinking. "The recreational market was a fragmented market with a variety of profitability levels, and overall not a whole lot of profitability in the market," said Fargo. Altor came in with the mindset to invest in the back-end infrastructure, to invest heavily in R&D and to compete with a 'nimble' product development strategy. "Our ambition is to be at least in the number two position (in terms of commercial marine electronics) by 2018," said Olsson.

The core tenants of the strategy includes highlighting that Navico as a whole is an adaptable and nimble company, courtesy of its recreational roots adept at identifying emerging technologies and delivering new product streams quickly and cost effectively given its volume and subsequent buying power. While new products targeting larger vessels is the core, the plan is to become a more relevant supplier that transcends simply selling a product, rather evolving to a whole systems package supplier including digital services.

"Simrad is our heritage, as it is the oldest of our brands, **but it is also our future on the commercial side"**

Christian Olsson, VP Commercial Marine, Americas

ECDIS: A Strong Core

Delivering advanced ECDIS is central to the Navico commercial maritime strategy, and at its core is ECDIS, specifically the Simrad E5024 ECDIS system which was launched a year ago and the Simrad MARIS ECDIS9000, which was recently upgraded. The Simrad E5024 ECDIS is an IMO compliant ECDIS, a modular system offering that is designed to be intuitive and easy-to-use, with simple installation in either single, dual, or triple ECDIS configurations. Designed for NAVTOR ENCs including UKHO (for AVCS), Primar, IC-ENC, and NOAA, additional benefits of the E5024 include its compatibility with Radar, AIS & ARPA overlay (Simrad Argus Radar). The E5024 ECDIS system also includes support for an optional secondary display station, delivering complete control of Ethernet-connected Simrad performance modules including radar, conventional echosounders, Forward-Scan sonar, and Structure Scan Imaging.

The Simrad MARIS ECDIS900 was upgraded to a new high-performance hardware platform with updated software. This system offers a feature rich solution that includes universal Radar overlay, multiple layers display, additional route planning functions, precise navigation tools and multiples add-on functions. The system has its own integrated chart management solution which includes PAYS and is distributed and managed via email or Internet, through MBA (MARIS Bridge Assistant) for ship chart management, and MCP, Maris Customer Portal, for ship and fleet monitoring.

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Photo: ClassNK

The Future

"ClassNK has a long history of 117 years, and ClassNK has grown to be one of the largest classifications societies for ships. My job is to sustain the growth for the coming generation and ensure a strong ClassNK for the next 100 years."

Fujiwara *Takes the Helm at* *ClassNK*

BY GREG TRAUTHWEIN

Last month Maritime Reporter & Engineering News visited ***Koichi Fujiwara,*** *the newly installed Chairman and President of ClassNK, in his Tokyo headquarters for his insights on the global maritime market at large as well as the future direction and mandate of class.*

With the global maritime market in the grips of a collective slump, the likes of which have not been seen since the energy crisis and resulting economic malaise of the mid 1970s, Koichi Fujiwara takes the mantle of leadership at ClassNK, one of the world's largest and most influential classification societies.

"Today the shipping and shipbuilding markets are both very tough, which naturally is not a good situation for classification societies," said Fujiwara. "My first priority is the stabilization of the ClassNK classification business based on the tough market conditions."

ClassNK has been on a bull run over the past five years, when in 2011 a change in Japanese law lifted some business shackles which had restricted its ability to grow. Today, like its classification brethren around the globe, it is able to pursue a number of new and diverse opportunities to grow its brand. ClassNK today is focused both on securing its present and building its future, a future that increasingly will focus on the emerging importance and rapidly expanding collection, analysis and use of information gathered on shipping fleets globally: in other words, 'The Internet of Things (IOT)' and 'Big Data'.

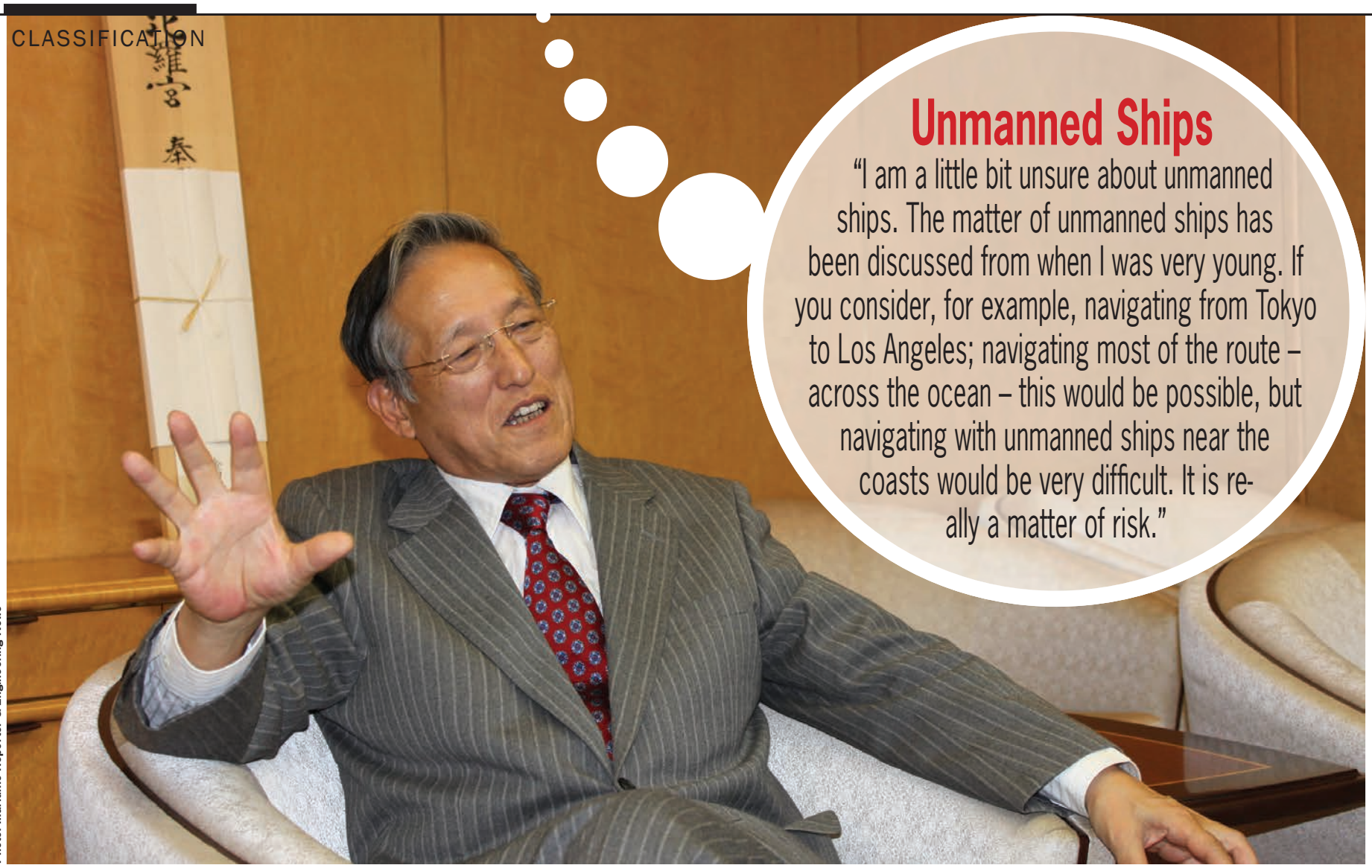
"After stabilizing the classification business, the next priority is for the future is to study and enable new technologies in the maritime field, such as Big Data, and to create new services that capitalize on and compliment these technologies," said Fujiwara. Even though multiple shipping markets are down, it is incumbent upon classification societies to invest to ensure that it is keeping ahead of the technological curve. "It is a challenge to weather a difficult market and at the same time invest for the future, but that is what we must do."

40 Years on the Job

While Fujiwara is new to the top spot at ClassNK, he has more than four decades of experience in the maritime field, lending to him and his organization a broad perspective in addressing the current market slump while simultaneously planning for the future and the inevitable market rebound.

"The hardest time for the shipbuilding industry was the late 1970s, immediately following the oil crisis, when there were almost no shipbuilding jobs for a few years," said Fujiwara. But in the mid-1970s the shipbuilding market was substantially different, dominated by Japanese and European shipbuilders; as the shipbuilding powers of South Korea and China were still in their infancy. When the smoke cleared many of the European shipyards simply disappeared, and the Japanese industry was shaken but still standing. As the undisputed market leader it was able to help shipbuilding rebound by adjusting shipbuilding capacity.

The ensuing two decades saw the emergence of two major shipbuilding powers which would first challenge then surpass the Japanese industry, first in South Korea followed by China. The result today is a double edged sword in shipbuilding circles, as "we have a huge oversupply of capacity on the shipbuilding market" coupled with zero cooperation amongst the shipbuilders in helping to reduce capacity. "The shipbuilding market today is a survival competition," Fujiwara said, noting that this is the first substantial down market and a very real challenge, particularly for the government controlled Chinese shipbuilders. In essence, the future of the shipbuilding



Unmanned Ships

"I am a little bit unsure about unmanned ships. The matter of unmanned ships has been discussed from when I was very young. If you consider, for example, navigating from Tokyo to Los Angeles; navigating most of the route – across the ocean – this would be possible, but navigating with unmanned ships near the coasts would be very difficult. It is really a matter of risk."

Photo: Maritime Reporter & Engineering News

market lies in the hands of what the Chinese government thinks the shipbuilding market should be, because international cooperation in regards to regulating capacity would be "impossible."

"Maybe the new shipbuilding market will require 60 to 70 million gt, but today the capacity is more than 100 million gt," said Fujiwara. "This is a huge oversupply."

IOT: The Internet of Things

Fujiwara is adamant that continued investment by ClassNK – even in the face of a historic market slump – is necessary to ensure that the organization remains ahead of the technical curve and fully ready to respond when the market inevitably returns to black. And when Fujiwara looks to the future and investment, much of it boils down to IOT, the 'Internet Of Things'. 'Internet Of Things' and 'Big Data' are handy catch-phrases to describe the revolution of data onboard ships and flowing ship to shore and back. But the focus on data is, of course, not centric to the data itself, rather focused on the collection, dissemination, analysis and final use of the information to make vessel operations more efficient, cost effective and safe. With the rapidity of IOT's growth within the maritime sector, it is sometime not clear where precisely to prioritize investment, but one investment for certain will be the need for additional measures in the area of Cyber Security. Another hot-button topic surrounding IOT and Big Data is the prospect of unmmaned ships.

"Some would say that the goal of IOT is unmanned navigation," said Fujiwara, "But I don't think so. IOT is critical in the support of numerous operations, and we are now studying the matter with several shipping companies." Fujiwara believes that at this point, IOT and Big Data is more about making incremental improvements in terms of efficiency and cost-effectiveness, with sweeping changes such as unmanned operations far in the future.

"It is up to the individual company to decide which software it intends to use for the best practices operation of the ship and communication with its customers," said Fujiwara. "We are not the shipowner; we are not the shipbuilder; we are a service provider." The classification society helps the ship owner evaluate their business, their operations, and define the fields and the areas where these companies might benefit from software or IOT solution. "We provide a base of their activities, and when necessary we evaluate the quality of the software technologies."

Maritime Market Assessment

"Really, right now, only the tanker market looks strong. As you know many Japanese shipbuilders are switching to the tanker markets, so naturally this sector of our business will expand. Our business traditionally has been bulk carriers, but today it is difficult to see the recovery of the bulk carrier market anytime soon," said Fujiwara.

"I'm afraid that those markets could be destroyed by oversupply (tanker and gas carrier), as they are smaller than the bulk carrier market and much more susceptible to oversupply concerns). But currently these markets are good, particularly when compared to the bulk carrier markets.

The container market is going through a tough time too … and combined with the bulk market this is the majority of the market for classification, too. In addition, the offshore market is very bad, too, but comparatively, the offshore business is very small for ClassNK."

(Photo: ABS)

ABS sharpening its global view

(Photo: ABS)

The American Bureau of Shipping (ABS), already one of the world's well-regarded classification societies, recently restructured its ranks to meet the perpetually evolving needs of its customers. Kirsi Tikka, the global head of marine, and Howard Fireman, CTO, explain.

BY GREG TRAUTHWEIN

While the business of ship classification is ever-evolving, it could be argued that today is a watershed of sorts in terms of this businesses evolution. Increasing amounts of data and data analytics are rapidly changing the operational profiles of ships at sea, and while the benefits are many, so too are the dangers, as the growing threat of cyber security comes to the fore.

In the middle of it all is classification, which is increasingly relied upon to be at the vanguard of technological council and insight, a valuable ear and invaluable partner in this historic progression. At the same time, class must integrate latest technologies and best practices in its own operations to consistently ensure that it itself is keeping one step ahead of the technological curve.

ABS is in the midst of a transition to meet and exceed these growing needs. "We established the new organization and it is a global organization to compliment our four geographic divisions," said Kirsi Tikka, Ph.D., Executive Vice

President – Global Marine. “These divisions have served us very well as we have very good local client contacts. We felt we needed to improve further, with a global view of the industry, and global marine was established to align our marine strategy with the global industry, and to provide additional client support in addition to the local client support supplied by the divisions. Also, to have a faster response to market trends and needs.”

Tikka admits that the ‘global view’ looks a bit weak today. “The markets are depressed, particularly on the dry bulk side, while the offshore industry and the liners have not been doing great either. (On the flip side) the tanker market has had a good run, but overall it is a fairly somber picture at the moment.

One thing that we try to do is assist them (ship owners) to deal with all of the complex regulations that we have in place, when the markets are not so good they might not invest as much, so ABS works with them to know the latest requirements and they’re needed actions and deadlines. We are partnering with the industry to help get them through this period. Our goal is to be recognized as having the best classifications services; to be recognized as a technology leader, and a trusted advisor to the industry.”

Big Data Comes of Age

Howard Fireman, Senior Vice President and Chief Technology Officer; and President of ABS’ Nautical Systems, is leading the charge on the technology side of the classification equation, and he agrees that the recent slowdown is a good time to regroup, streamline and prepare for the future. “As Kirsi said, you prepare for the future during this market hiatus, and it is a good time for me to look a the global technology organization, and say ‘okay, in tandem with where we see we’re going with classification, and the fact that we’re going with more of a market sector face to our clients and the global industry, what changes should I make,’” said Fireman.

In his corner of ABS, Fireman leads a team that deals with cyber security issues and software, and another team that deals with data management and data analytics. He cannot emphasize enough the growing importance regarding data and cyber security, calling it the third big piece in the safety continuum after hull and machinery. But as complex as the data and cyber side of the fence becomes, the mission still is clear and simplistic: safety, particularly when it comes to impact on people.

Fireman explains that the security initiatives are growing rapidly, and safety checks are not simply limited to the equipment installation, noting that regular software updates across a broad spectrum of equipment each come with the potential to cause problems and conflicts with other software in the chain, or perhaps even open a security breach. “People really want to understand, with

"Our goal is to be recognized as having the best classifications services; **to be a recognized as a technology leader,** and a trusted advisor."

Kirsi Tikka, Ph.D.,
Executive Vice President – Global Marine

"We have a **'Future Class initiative'** (trademarked) and the future is data centric."

Howard Fireman, SVP and CTO,
& President of ABS' Nautical Systems

The Data Conundrum

While much discussion today centers on "Big Data," Howard Fireman, CTO, ABS explains that it's a discussion of quantity and quality. "Data by itself is interesting, but until you verify the data (it's not really useful)," said Fireman.

You have to look at it, remove the 'noise', you have to understand the potential shortcomings before you start applying things, and you have to really go through that information to optimize the data to ensure that it is filtered, processed and applied correctly. "What is our data strategy? That's a very important discussion that we can't have today because it's still under development, but we're working that one pretty hard. One of my objectives is: can I (help to) make the rules development process better?"

"The other part that we have that can help our clients is the Nautical Systems platform. We have a lot of tools in there that can help clients ensure that they have the right information."

all of these different OEMs and vendors and software systems coming together, they really want to understand the failure modes," said Fireman. "The failure modes that we're worried about is of course the equipment, but also the potential impact on people."

"People want to push updates to you all of the time, but do people really understand the risks that potentially come with each of these updates?"

Safety and security on the cyber front demands vigilance and verification. Fireman noted one case where an owner conducted an audit of its electronic information flow, and despite assurances from one vendor that information was simply being pushed from the vendor to the owner, information was also flowing back to the OEM.

"The risks are there, and part of our job is understanding what those risks are, and if we put our notation we are backing up technically and saying that we understand the process that was used, the verification of the software, and of course the configuration management piece," Fireman said. "It's not just about the software load that you had at delivery, but what has happened throughout. That's where you see the vulnerability."

The Changing Face of Class

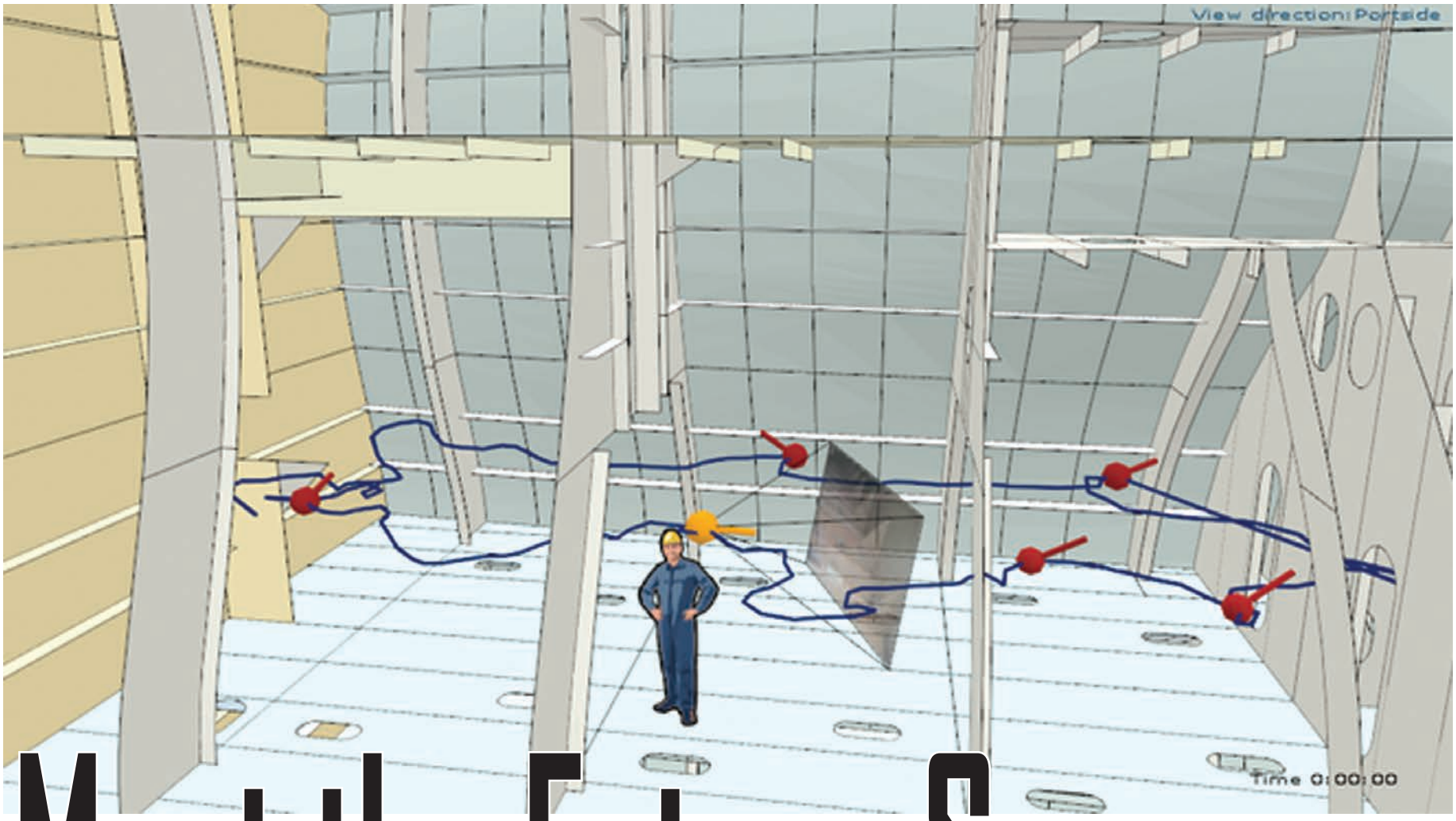
The very nature of class is changing too, as classification societies incorporate latest technologies to ensure that it collects and analyzes information as efficiently a possible. "The future of class: we're going to conduct our existing class services differently, based on the technology change," said Fireman. "We have a 'Future Class initiative' (trademarked) and the future is data centric."

He explains that as the world becomes more data centric some traditional roles and boundaries are getting a bit fuzzy as more information is available 24/7/365 regarding a ship's performance and asset health. In particular, the plethora of new regulations regarding ships, energy efficiency and the environment is triggering a number of fundamental technology changes onboard ships. In addition to standard structural and mechanical asset integrity issues, you must through in the mix the growing area of cyber security and issues.

To this end, ABS is evaluating several new technologies that will enable it to do its job more efficiently in coming years.

"Technology will enable us to do our job better," said Tikka. "But the one difference that we as a class society need to keep in mind compared to organizations that use data to target certain markets or develop new products, when we use data, we use it to make safety decisions. It is a very different type of use, and it puts higher demands on the quality and reliability of the data."

"It's very important that I build the technology that support the business strategies" Fireman summarizes. "But my time horizon is longer: now is a great time for me to really prepare for when the slow time is over, and develop the products that we'll need for the global markets. So I need to go faster when things are slower, and the reorganization is central to setting this in motion."



(Images Courtesy of DNV GL)

Meet the Future Surveyor

Knut Ørbeck-Nilssen, CEO Maritime, DNV GL discusses the future of class

DNV GL is now integrated and fully armed to address the challenges of the day. **Drones for tank inspections?** Virtual surveyors? **Unmanned ships?** *DNV GL leaves no stone unturned in the quest to bring class into the future as Knut Ørbeck-Nilssen, CEO, DNV GL – Maritime, explained to MR in March.*

BY GREG TRAUTHWEIN

Among classification societies DNV GL seemingly perpetually pushes the edge of innovation, with a combined Norwegian and German pedigree and a cumulative maritime experience more than three centuries. It was a little more than three years ago when it was announced that classification societies DNV and GL would merge into one, and according to Knut Ørbeck-Nilssen, CEO, DNV GL – Maritime that process is, for all intents and purposes, completed. With that box ticked, Ørbeck-Nilssen and crew now turn attention to battening down the proverbial hatches and riding out the current market slowdown, all the while planning for and investing in a future that may not provide growth anytime soon.

"Many of the markets are quite depressed at the moment, so we, having merged two and a half years ago, are in a really good position now," said Ørbeck-Nilssen. "In 2013 we had already started to enjoy the synergies of the connection and to take out costs. So we have now created an excellent platform to deliver

"For us (as a classification society), we're really not concerned with being the biggest. We are interested to be the leading classification society in terms of safety and quality and service level and innovation."

Knut Ørbeck-Nilssen, CEO Maritime, DNV GL

Data Smart: The future of class will rely not simply on possessing the most data, rather utilizing that data most effectively.

in challenging markets."

In counting his classification blessings, Ørbeck-Nilssen contends that DNV GL has:

- The widest distribution of offices serving the maritime industry
- A streamlined organization with many of the double functions (of the two organizations) removed, allowing it to reduce its cost base significantly.
- A scale and set-up that is ideal for the coming 5 years.

DATE Night

While DNV GL talks up the role of emerging technologies as well as anyone, Ørbeck-Nilssen contends that his team's mission is simple and focused: to be very close to the maritime industry and to the customers as a class society, providing excellent services on safety and quality.

In fact the merger process truly allowed management to strip down to the bare essence of class, effectively keeping the good and jettisoning the bad. "We reached out to the major stakeholders to strategically position the rule set … 2,000 comments from more than 800 stakeholders led to 700 rule modifications," said Ørbeck-Nilssen "That's the way we like to work, to really engage the industry, getting better proposals in hands."

While the merger process resulted in a number of enhancements across the organization, Ørbeck-Nilssen is most keen to discuss DATE, which means Direct Access to Technical Experts.

"Speed matters a lot in the maritime industry, and to be able to respond fast to our customer's requests is a top priority," said Ørbeck-Nilssen. "We have set up a system called DATE (Direct Access to Technical Experts). This is five centers that we maintain in different time zones around the world, staffed by technical experts dealing with requests from customers 24/7/365."

The goal is seamless global coverage established to answer customer's questions quickly and effectively courtesy of five hubs situated in Singapore, Houston, Piraeus, Hamburg and Oslo. Take for example a request coming into Hamburg at 8 p.m. Friday evening. If Hamburg is unable to resolve the matter, the problem will be shifted to Houston for resolution, who works with the customer directly.

"With this, we are delivering a response in less than 6 hours on more than 75% of the cases," said Ørbeck-Nilssen. "I think that this is really leading in the industry, and there is no added cost to the customer."

The key to DATE's success is not simply bolting on staff, rather deploying existing staff and knowledge more intelligently. "We had all of the experts onboard, it was more about how we move these experts – not physically but virtually moved – closer to the action and the customers," said Ørbeck-Nilssen. "For us, taking class to the next step is really about being data smart, and how we can utilize digitalization in the effort."

More Tech Tools

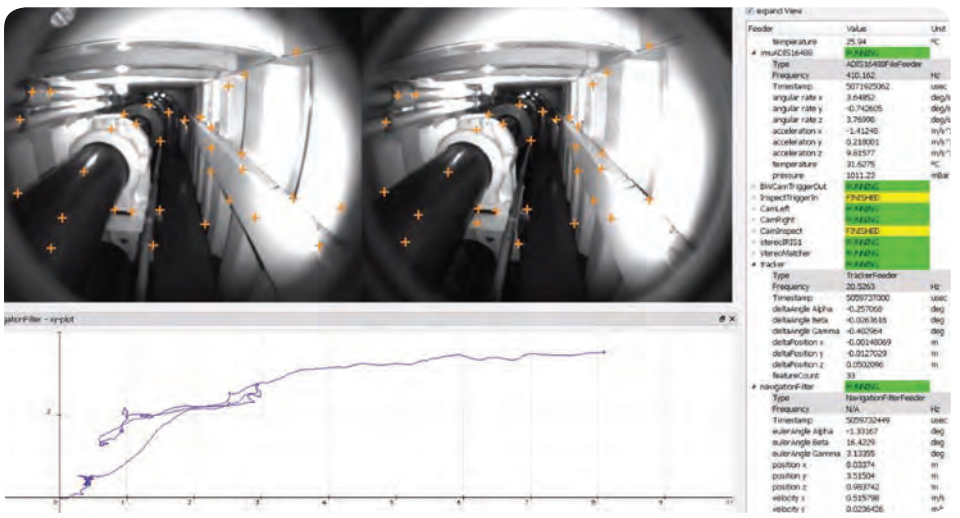
As the shipping and shipbuilding world evolve, so too does class. DNV GL in particular is keen to invest in technologies that it views as not simply cheaper, rather more efficient and effective too. To that end it offers:

ECO Insight

"We developed a product that we feel is at the vanguard of digitalization in ECO Insight," said Ørbeck-Nilssen. "ECO Insight is designed to help owners and operators optimize vessel performance." For example, fuel cost continues to be a large area of focus, and even though the cost of fuel has come down, it still represents a significant cost for the ship owner. According to DNV GL, ECO Insight offers a better way of benchmarking their operations, not simply vessel to vessel, but vessel to fleet, and ultimately vessel to world fleet. "ECO Insight is a unique product in the way in which it combines all of the data that DNV GL has on the vessels, and combines with the AIS system so that we at any one point in time know where the vessel is, where it is going, and we can combine with fuel and weather data," said Ørbeck-Nilssen. "We can combine various data streams to determine how the vessel is doing, how well the fleet is doing. I think we will see much more of this in the future; the way in which you can combine different data streams."

Drones

DNV GL is eagerly exploring the use of drones in its work, with the aim of increasing quality while reducing risk during the survey process. "We need to look at new technologies to see how we can use them to modernize the way we work, how we interact with our customers," said Ørbeck-Nilssen. "If you are inside of a tank, you can fly that drone, outfit-



Seamless Connectivity between ship and shore, to monitor systems and identify problems before they result in a breakdown, is core to the future of class.

ted with a flash and a video camera. You can fly it all the way up to the underside of the deck and you can get a very clear close visual inspection to check corrosion, cracks and to see if there is a need for closer inspection. By doing this, you save much effort and the need for scaffolding. The next step in this development is to see how you can make the drone system explosion proof. If you are able to put a drone in that situation where it is guaranteed not to produce any sparks, you don't even have to gas free the hold, saving cost and time for the operator."

Virtual Surveyor

"We are open to look to other industries for inspiration and ideas, and to that end we have had for a couple of years an interesting project with the German Aeronautical Institute, looking at ways to see how can we put a camera on our surveyors helmet, to digitize the results of the inspections," said Ørbeck-Nilssen. This is not simply a system to take photos, rather a complete video imaging set up including measurements on photos so that it is provided to scale. Once captured, the photos are immediately correlated to the exact place on the vessel courtesy of the electronic drawing or 3D model, allowing the next inspector to see the past inspection trends. In short the system will create a digital model where the vessel is represented virtually with data and images added from inspections. The system is in its development phase through 2016. For the ship owner it provides readily available data that can be streamlined immediately to its headquarters, allowing them to engage not only with the crew onboard, but the company experts at the home office. "You get a much more interactive dialogue, rather than post-inspection back and forth. You really integrate, and it brings us much closer to the customer," said Ørbeck-Nilssen. "If you project this a little bit further into the future, you can ask: who is carrying the helmet, who is flying the drone? It could be a surveyor, it could be the crew. This has the possibility to really take the business of surveying to the next step, giving us a virtual presence onboard the ship versus having a surveyor onboard as often as today. Naturally we would like to be onboard at certain intervals, but if some of the physical presence of today can be replaced by virtual presence, it could create some really interesting opportunities."

Data Smart

When talk inevitably turns to 'Big Data,' Ørbeck-Nilssen contends that there is a lot of fluff in the industry conversation, and he thinks discussions should center on practical application of data to shipping operations.

"For DNV GL it is really important to try and make this as concrete as possible," said Ørbeck-Nilssen. "As an example, we were really fortunate to get six months of operating history from an advanced vessel from a ship owner, a vessel with about 10,000 sensors."

DNV GL had a pair of its data scientists examine the data, extracting some useful information. "As engineers we are always preoccupied with understanding 'why', so if this breaks down, why is it happening," said Ørbeck-Nilssen. In examining the data it was found that one critical piece of equipment consistently had an increasing the temperature pattern throughout the six months trial, meaning the friction was also rising. If it had gone unnoticed long term, it would have resulted in a breakdown or an early maintenance event. In examining the data, the heat spike was correlated to a specific crew, and by talking to the crew members, they could release the torque a bit, the friction and temperature came down, and the equipment was saved from failure or early maintenance. But Ørbeck-Nilssen admits that change does not come quickly or easily.

"These things come with investment," said Ørbeck-Nilssen. "You need sensors on the ship, you need to access, store and analyze the data. I think really it's about demonstrating how this can be useful to save costs, increase efficiency or increase safety."

With the shipping industry always closely eyeing decisions by the USCG, to answer the tough questions we ask Adm. Paul Zukunft

The Commandant

BY GREG TRAUTHWEIN

Admiral, we met about a year ago in your office, and as you close in on two years as Commandant of the United States Coast Guard, can you just share with me how your visions of this position and your objective have changed from day one to today?

When we last spoke, I probably talked a little bit about strategy driving budget. So what are those strategies? We have a strategy for the Arctic and we didn't make the strategy in a vacuum, we worked to make sure that the White House saw this as an emerging area where the U.S. has strategic interest. We put out another strategy on Western Hemisphere. We have our own strategy on energy, the energy renaissance, but more importantly, the role of the Coast Guard in regulating and facilitating that commerce. And then we have another one on cyber. While at the same time, we're still an armed service and there are points in the year where you'll find the Coast Guard deployed on all seven continents across the globe. So, what I would tell you is, what has not changed (are the fact that our) services are in constant demand, and you just have to make those conscious decisions of where we can be and, more importantly, where we may not be.

Can you put in perspective for me the challenges to the United States Coast Guard in dealing with cheaper, more readily accessible technologies that could pose a threat to your fleet and the country?

Probably the biggest asymmetrical threat, Greg, is in the cyber domain. It costs nothing whatsoever to invest in cyber, so to say, but you can use it to disrupt port activity, you can use it to disrupt shipping activity, or if it's sophisticated enough, you might actually use that against our naval forces, which includes the Coast Guard, as well.

So that's probably the typical asymmetrical threat, but I'll just give you another example. At the previous International Sea Power Symposium, where more than 100 maritime nations come together at Newport, R.I., almost all those nations are talking about this other asymmetrical threat.

Not a military threat, but poaching in an economic exclusive zone; dwindling fish stocks, human trafficking, drug trafficking, movement of weapons, and all of that moving via maritime through a criminal organization network. So many of these nations are looking at what they need to double down on their investments in Coast Guard-like platforms to deal with the most relevant threat that is facing their maritime borders today.

Admiral Paul Zukunft
Commandant, United States Coast Guard

Coast Guard Photo

We've met with industry and they are keenly incentivized to build the heavy icebreakers here in the United States. So I'm much more optimistic today than I was two years ago when I start looking at our future, and more importantly, if we're an Arctic nation, our ability to say more than words but match that with our deeds, as well. It's as imperative that we do exert U.S. influence in this domain, but we cannot do it from the shore – we must be operating in this domain, as well.

Coast Guard Photo

Okay. So in looking at the cyber threat, can you discuss with me how the Coast Guard is investing to address this growing threat? On the flipside, how is the Coast Guard using cyber capabilities to do its mission more efficiently?

We rolled out a cyber strategy almost a year ago. First we need to defend our network; hardening our defenses so others can't penetrate it. (Second) is using it in an offense manner. So how do you use cyber offensively? Well, one, we take the "search" out of "rescue." If someone has a distress beacon using cyber, we know where they are. And the third strand of this is how do we protect our maritime transportation system against cyber threats. In this capacity, I represent the United States at the International Maritime Organization general assembly. So as we're looking at international standards for cyber best practices, if you will, in the maritime domain.

Over the last five or six years there have been mobile offshore drilling units in the Gulf of Mexico that have driven off the drill site due to malware that was introduced into their control systems, where they lost a signal to stay within a swing circle. So they literally drove off the well site, and when that happens, the only thing to prevent a major oil spill is the blowout preventer. And in each of the cases, the blowout preventer worked.

So industry is now turning to the Coast Guard, saying, 'So, Coast Guard, you approve life jackets, flares, and life-saving equipment, what can you do about cyber?' We're working across all the industry and really trying to share these best guidelines, not as "law" or "regulation," but really guidelines that is in everyone's mutual best interest, and recognizing that cyber is an evolving threat.

Switching gears to the Arctic: For our readers who are not in the know, can you discuss in detail the current plan, the time frame, to accelerate the current acquisition of the heavy icebreaker, and the plan for additional ice breakers?

In our president's budgets request for 2017, there's about $150 million set aside that gets us out of the starting blocks (in the need to recapitalize our icebreakers). Human activity is clearly on the uptick up in the Arctic. A cruise ship will transit through the Bering Strait across the Northwest Passage with 1,600 people embarked in an area that's not charted to modern day standards. The starting price for most of those tickets is around $20,000, so a pretty lucrative market if you're in the cruise shipping industry. We anticipate there will be more such activity. What we could not anticipate was the rapid reduction in price per barrel of oil. So it went from $110 a barrel, roughly two years ago, to today it's barely

hovering at $40, and it may stay in that price range for some period of time to come. But it won't be there indefinitely, and as oil prices start to recover, we fully expect there will be more oil and gas exploration up in the Arctic, as well, in the offshore domain. And there are a number of other nations interested in the Arctic, too. Then we start looking at the traffic across the Arctic – whether it's the Northwest Passage or the northern sea route, Canada and Russia treat those as internal waters, not the high seas, so there are navigation concerns in those domains, as well, looking forward, much like we have Freedom of Navigation concerns in the South China Sea. But make no mistake, the United States is an Arctic nation. It's not an area where we have invested, really, in any significant way in more than a couple of decades. So with the president's announcement back in September that one, we're an Arctic nation, and two, we need to invest in icebreakers, his budget request for 2017 actually starts to put some meaningful money into making this investment into the Arctic. We've met with industry and they are keenly incentivized to build the heavy icebreakers here in the United States. So I'm much more optimistic today than I was two years ago when I start looking at our future, and more importantly, if we're an Arctic nation, our ability to say more than words but match that with our deeds, as well. It's as imperative that we do exert U.S. influence in this domain, but we cannot do it from the shore – we must be operating in this domain, as well.

Regarding acquisition and recapitalization: how do you see the fleet and its capabilities evolving over the next generation?

If I were to look at my crystal ball, looking out 20 years, by that time we will have completed all 58 of our fast-response cutters, our new patrol boats, very capable platforms. Twenty years from now, our national security cutters (we just had a ninth one added into our '16 budget) won't even be at their half-life yet. And 20 years from now, we will have just completed building all 25 of our offshore patrol cutters. That really is going be the foundation of the Coast Guard. Twenty years from now, we'll be much more engaged in unmanned systems in the air and probably under and on the water, as well. And if I look out 20 years from now, we should have at least two, like-new, heavy icebreakers with probably at least 30 years of service life remaining on them, as well. Those would be the "heavy artillery" of the Coast Guard.

So on a hardware side, and within our acquisition budget, I'm actually quite optimistic. Our acquisition budget in '16 doubled: the best acquisition budget ever dating back to 1790 for the United States Coast Guard.

But what I can't take my eye off the ball on is the most critical element: people. We must continue to invest in our human resource capital, not just recruiting, the training, but more importantly, the retention of that work force, as well. So you can have all the great tools in the kit, but if you don't have that human resource capital, it could be a potential train wreck for us. The last strategy we rolled out (about three or four months ago) is the human strategy for the Coast Guard that looks at recruiting, training, retaining active duty, reserve, civilian, and yes, even our all-volunteer auxiliary workforce, because we need them all.

Coast Guard Photos

Over the last five or six years there have been mobile offshore drilling units in the Gulf of Mexico that have driven off the drill site due to malware that was introduced into their control systems where they lost a signal to stay within a swing circle. The only thing to prevent a major oil spill is the blowout preventer. And in each of the cases, the blowout preventer worked.

So in the span of your career, can you put in perspective for me how hard it is to find (and keep) good people today?

The talent that we are drawing to the Coast Guard today is nearly unprecedented. I spent a fair amount of time at our Coast Guard Academy today, which is now at its most diverse point than it's ever been in the history of the Coast Guard. The last two classes came in with 40 percent women, 33 percent under-represented minorities, their SAT scores, their GPA, their athletic capabilities, and their hunger to serve our nation is like I've never seen before.

So once you have them, what's the biggest challenge to keeping them?

Well, we are going for the top 10 percent, not the bottom 5 percent, and it should come as no surprise, Silicon Valley is going for that very same percentile. If they can't find it in our high schools and colleges, then they'll look to the uniformed services – folks with background clearances, tremendous work ethics, integrity, and they'll be more than happy to hire them out from under us. And the shipping industry is no different; in the airline industry, no different, either. So there are a number of head-hunters competing for the same talent, or looking for, in uniform, and perhaps giving them an "offer they can't refuse." So how do you retain these folks as we look into the 21st Century? How do you build that brand loyalty? I go back to some of my initial foundational experiences as a junior officer, that caused me to say, "I am all in. This is what I will do for the rest of my life or as long as they let me serve in the Coast Guard." So how do I get that same level of commitment, that sense of belonging that isn't as much about a paycheck as it is about that commitment, that sense of accomplishment that you can only get by serving in the Coast Guard.

Very good. If I remember correctly, that "moment of realization" for you was the Mariel boatlift when somebody threw you their baby.

That was it! That baby is probably a middle aged adult by now.

We hope so! Switching gears again: How is the lingering low price of oil and gas affecting the Coast Guard and its operations?

I was over in Port Fourchon, Louisiana, at the end of the year, and it was a big parking lot: jack-up rigs, offshore support vessels, the whole fleet laid up.

And with that, more than 60,000 offshore oil workers out of work. And with the volatility of the crude oil market you have to ask yourself what happens if it goes the other way? What if all of a sudden all of the ships sail away; who is going to man those ships? We have to anticipate that change, as well.

And simultaneously we are now seeing the build-out (and delivery) of dual-fuel ships, and we need to make sure that we are staying ahead of that technology. The United States has not even tapped into its export potential, or maybe even domestic distribution of LNG via maritime means. For a nation who sits on the largest volume of LNG reserves in the world, the Coast Guard is going to have to keep its eye on that ball, because we want to be the facilitator – not the impediment – to that commodity as it enters the marketplace.

Very good. When we met last year I remember with distinction the emphasis and importance you placed on meeting and thwarting the illicit drug flow in the United States. Assuming that the tide of illegal drug flow can be turned, what do you see as the drivers for change, either in the context of the Coast Guard operations, society in general, or both?

One, we have to change the narrative on the whole drug flow conundrum. I will never use the term "war on drugs." If there was a "war on drugs," we would be flying air strikes on known cocaine cultivation sites in Columbia today. That is not happening. In fact, during the peace process between the government of Columbia and FARC, one of the conditions is no more aerial eradication, which stopped on September 1.

The cultivation does not stop; in fact, cultivation is on the upswing. Clearly, we need to do something about the demand for drugs, but at the same time we need to address the security environment which has turned for the worse in some of these Central American countries. Where we hold the upper hand, quite honestly, is at sea where we can interdict these drugs. Last year, we took 700 smugglers, extradited to the United States for prosecution; nearly 200 metric tons taken out of circulation. In fact, this year, our trends are even better, and most of it is due to the increased Coast Guard presence, and also the contributions of Customs and Border Protection, our Navy, and most significantly, our allied navies, as well.

Every position, every organization has its challenges. What do you consider the top challenge to you, personally, as the Commandant and to the United States Coast Guard as a whole?

I can't narrow it down to one, but my biggest challenge – and you alluded to that earlier, Greg – is the health of the workforce. Is it a healthy workforce today? Absolutely. But you cannot be complacent. Many of our work force are married to other members of the military. And we are a workforce of itinerant workers. I've moved, I think 21 times now since I've been in the Coast Guard. So when I start looking at our female commissioned officers; it's great that we have numbers coming into our workforce, but at 10 years of service, we lose nearly 50% of them. And so what are the dynamics that cause our female officers to leave the service? Can you have it all? You can have two successful careers, can you raise a family, and can you do that leapfrogging all over the country every two to three years? So one thing we're doing is that maybe we don't move people as often as we do.

That we reward geographic stability. There used to be a stigma, we used to call it "homesteading," and shame on you if you didn't move 15 times in 20 years – that's not a successful career. There are actually benefits to not moving people as often. One, it helps the family. Two, we work hand in hand with the communities in which we serve, especially across the emergency response community. And then third, it saves a lot of money: money that we don't have to move people, but if we don't lose folks, then you don't have to recruit, train, those people who lead, as well. So that's really the essence of the human capital strategy – we need to be a more specialized workforce.

I've been very optimistic about our ability to acquire new things, but that's just hardware. What really makes it all work is the people.

The Importance of People

We must continue to invest in our human resource capital, not just recruiting, the training, but more importantly, the retention of that work force, as well. **So you can have all the great tools in the kit, but if you don't have that human resource capital, it could be a potential train wreck for us.**

Coast Guard Photo

When you look at the migration issues happening today in the Mediterranean, and all the political, the human tragedy, and the maritime issues that are wrapped up into this historic migration, what are your thoughts?

With my Coast Guard hat on … there was an initial request that maybe we should send Coast Guard cutters to the Aegean Sea. I look at my own experiences, and at one point I was the Captain of the (270-ft.) Coast Guard cutter Harriet Lane in 1994. Much like Mariel, we had a mass exodus leaving Haiti and at one point I had 880 migrants on my flight deck. In fact, one of the migrants gave birth, and now we have an infant born on a war ship and we were 881. Does the child go back to Haiti, or are they now a U.S. citizen born on a U.S. war ship. So I superimposed that experience on what's happening in the Aegean Sea and the Mediterranean right now. So say it's a U.S. Coast Guard vessel now with 880 migrants (and you have to ask) who are these people? What is their background? Do they pose a threat to the United States? Are they brought back to Turkey or Greece … but what if Turkey or Greece says, "Sorry, United States, now they're yours?" (In short) there are some policy gaps. I have offered up to send subject matter experts to look at the logistics behind a mass migration that, by all indications, has no end in sight.

Average Coast Guard Day

On an average day, the Coast Guard:

- Conducts 45 search and rescue cases;
- Saves 10 lives;
- Saves over $1.2M in property;
- Seizes 874 pounds of cocaine and 214 pounds of marijuana
- Conducts 57 waterborne patrols of maritime infrastructure;
- Interdicts 17 illegal migrants;
- Escorts 5 high-capacity passenger vessels;
- Conducts 24 security boardings in and around U.S. ports;
- Screens 360 merchant vessels for potential security threats prior to arrival in U.S. ports;
- Conducts 14 fisheries conservation boardings;
- Services 82 buoys and fixed aids to navigation;
- Investigates 35 pollution incidents;
- Completes 26 safety examinations on foreign vessels;
- Conducts 105 marine inspections;
- Investigates 14 marine casualties involving commercial vessels;
- Facilitates movement of $8.7B worth of goods and commodities through the Nation's Maritime Transportation System.

Workboat Design & Construction

Tech & Design Solutions for Modern Workboats

BY KATHY A. SMITH

EPA Tier 4 regulations (for engines of 804 hp and higher) and propulsion advancements have many manufacturers and vessel designers changing course to adapt to new requirements and customer demands.

Jensen Maritime is designing a new 110-ft. harbor class ship assist docking tug with 6,770 horsepower. "It's a little larger than most. The extra length allows for towing which is secondary use," says Vice President Johan Sperling. "There will be Tier 4 equipment in it. It's new territory and we believe this will become the minimum size vessel that you'll see on the West Coast going forward."

Bryan Nichols, Director of Jensen's business development, observes that Jensen's customers want to map out multipurpose vessels they can build and still operate within the ship assist and escort sector. "A single tug can be more efficient," he says. "We've maximized this vessel under the rules so it can be operated efficiently under the 500 ITC regulations."

Robert Allan Limited's (RAL) President Mike Fitzpatrick reports RAL has been working with most of the engine manufacturers and owners in the U.S. to make sure that tugs they're going to build for next year will be capable of taking the extra equipment on board. "It's causing us a few redesign efforts but for most of our tugs, it's not a major problem," he says. "There is a cost implication for owners to comply with IMO Tier 3 and EPA Tier 4 requirements, which is causing an increase in engine prices of about 30 percent regarding Tier 4, which probably results in a five percent increase in total construction costs for U.S.-built tugs. In some countries such as Asia, with low labor costs, total costs can increase by 10 percent."

Image: Mike Zelt

"There is a cost implication for owners to comply with IMO Tier 3 and EPA Tier 4 requirements, **which is causing an increase in engine prices of about 30 percent regarding Tier 4**, which probably results in a five percent increase in total construction costs for U.S.-built tugs. In some countries such as Asia, with low labor costs, total costs can increase by 10 percent."

Mike Fitzpatrick, President, Robert Allan Limited's (RAL)

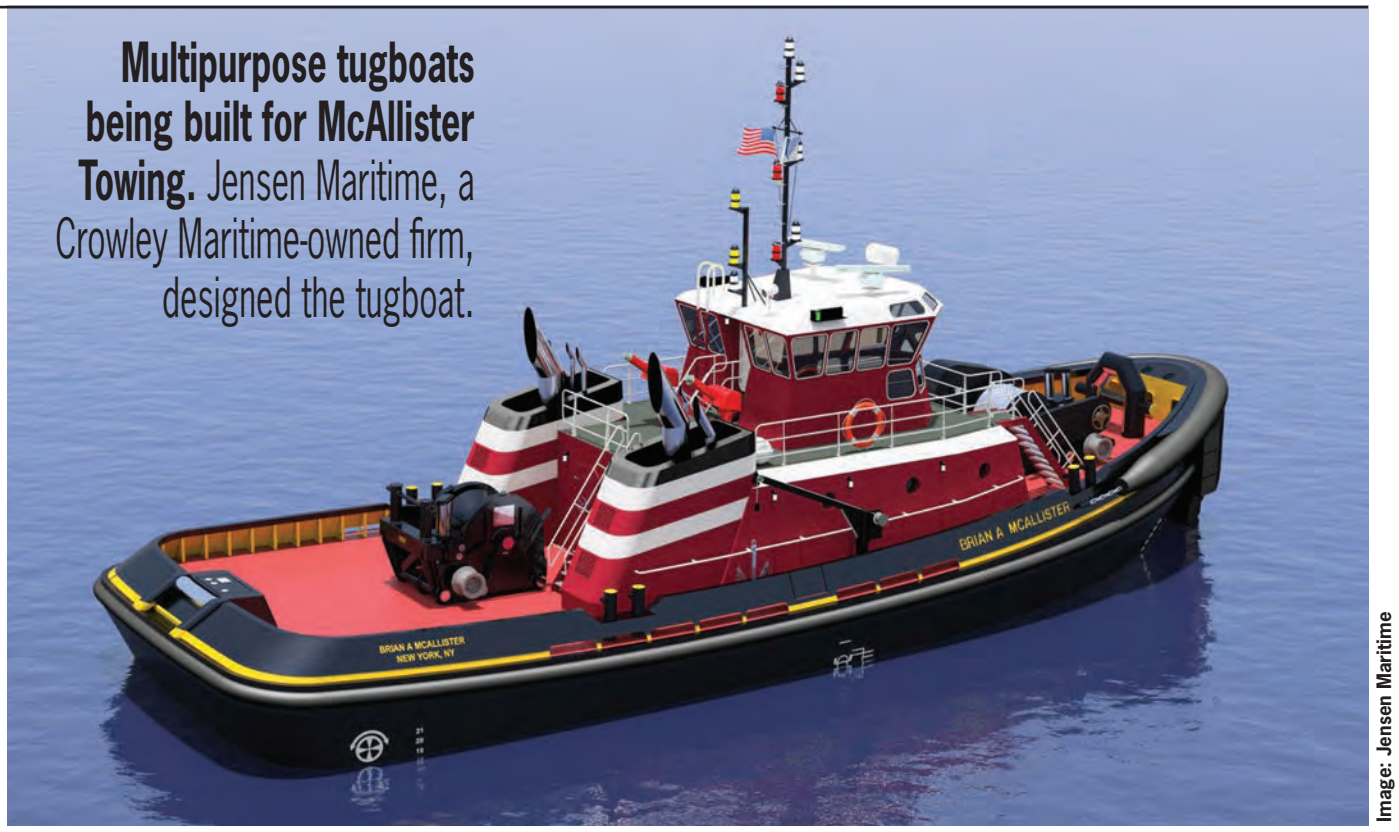
Jensen designed two Tier 4 multipurpose tugs currently under construction for New York-headquartered McAllister Towing. The two 100-foot-long, 40-foot-wide escort vessels, each with 6,770-horsepower, are powered by 3516E Tier 4 Caterpillar engines and Schottel SRP4000FP Z-drive propulsion units. They are scheduled for delivery in 2017. The Brian A. McAllister and the Rosemary McAllister will be the first in the fleet to utilize high-efficiency catalytic after-treatment technology to reduce emissions and will have an approximate bollard pull of 90 short tons.

While Tier 4 is a current hot topic, LNG is still in the offing despite slumping oil prices. "We have different LNG harbor tugs and various other designs ready to go for customers who don't want to live with Tier 4 requirements," says Sperling, who notes Jensen's parent company Crowley has spent a considerable amount of investment in LNG.

RAL's Fitzpatrick explains, "The average cost differential to build a small tug with LNG burning fuel capability might be as high as 40 percent." For the most

part, he says, the market is still looking at hybrid options. “Even there it’s hard to build an economic case for hybrids. Tugs operate at lower power, so they don’t burn a lot of fuel. The cost differential of a hybrid tug might be $2 million, and at current fuel prices, it takes a long time to pay that back.”

Seattle-based Elliott Bay Design Group, recently designed a new 95-ft tug built this year for a Harley Marine ATB configuration with Tier 3 engines, but John Waterhouse, Chief Concept Engineer, says it’s the first tug the company has designed in several years. On Tier 4, he says, “We adapt designs to suit these extra pieces of equipment that are now



Multipurpose tugboats being built for McAllister Towing. Jensen Maritime, a Crowley Maritime-owned firm, designed the tugboat.

Image: Jensen Maritime

being added to some vessels, however some projects we have are below the displacement range requirements for Tier 4." He also expects to see more reinvestment in equipment for the North Pacific fishing vessel fleet, which may come about as it did in the 1980 when several offshore supply boats were repurposed for commercial fishing.

Interest in hybrid solutions for advanced commercial fishing vessels is on the rise, notes Knut E. Røsvik, Senior Vice President Propulsion, Product Management, Rolls-Royce Marine AS. "I expect this trend of electrification we see in commercial and offshore vessels will also be a direction for other kinds of workboats as well," he says.

Recently, one of the first BG33-45 Bergen B series low sulphur-burning diesel engine was installed on a 79 m factory shrimp stern trawler of Rolls-Royce NVC 374 design for a Canadian shipowner that is expected to be delivered from VARD's Aukra yard in Norway in December 2016. The new engine, launched in 2015, offers a 20 percent increase in power per cylinder, over the current Rolls-Royce Bergen B-series engines, which allows the power demand to be met with fewer cylinders.

The advanced technology also includes Rolls-Royce's Promas integrated propeller rudder system, which provides increased propulsion efficiency for both single screw and twin screw configurations helping to reduce fuel consumption in both towing and transit conditions. Additionally, a power electric system with a hybrid shaft generator is also part of the propulsion package. "We have spent a lot of Research and Development investment in developing this leading edge system, analyzing the design through CFD and other techniques to refine it," says Røsvik.

When asked what is coming for workboat propulsion solutions and how much more can be tweaked to match what's expected in the future, he says, "We tend to think what we have today has achieved what is possible to achieve. But every time we expend the effort to use our best engineers who are developing new tools and techniques, we find there is more to gain."

Lifecycle costs are also a pressing issue for vessel owners, according to Røsvik. "I think one of the enablers that can make a difference is equipment monitoring systems," he says. "Our customers want to increase the service intervals on our equipment from what is currently three to five years to 10-year intervals. A trend we see increasing is to be able to do condition-based overhauls of the equipment. Instead of doing it at a five-year interval, the overhaul is done when the condition monitoring system tells you it's time to do it."

The use of Z-drive technology in the North American inland river market is becoming the norm, thanks to propulsion supplier ZF Marine Propulsion Systems Miramar, LLC (ZF). The Florida-based company, representing the marine components division of the Germany-headquartered ZF Group, has been helping owners change the design of their fleets and modernize the propulsion systems they've been using for 60 years.

"Our thruster technology allows customers to look at using smaller engines but gain better performance than some of their older vessels so they can reduce fuel burn," says Edward Schwarz, Industrial Technology, Business Unit Marine Propulsion Systems, Business Develop-

A ZF Marine Well Mount Azimuth Thruster being prepared for shipment to an inland waterway project.

Photo: ZF

ment Manager. ZF also provides parts commonality across propulsion platforms in order to help fleets reduce parts inventory.

With a variety of innovative products such as transmissions, control systems, thrusters and propellers, and offices worldwide, ZF is a significant player in the commercial market. While the name of the game is to help vessel owners improve fuel economy and efficiency by optimizing drive systems for workboats, Schwarz says increasing vessel safety is also critical. “As contracts get more competitive as more requirements come in, everyone is looking to run their vessels as safely as possible, so we’re always looking at areas where we can improve safety. We’ve provided thrusters for over 40 new vessels in a little over three years. This technology is helping make our customer’s vessels safer and brings modern engineering to their systems.”

On another safety note, RAL’s Fitzpatrick says the new Maritime Labor Convention regulations for crew accommodation is causing most tugs to get bigger. “Tugs have become shorter and wider to accommodate that, but we’re now putting 80 ton bollard pull in a 25-meter tug that a few years ago would have been maxed out at 60 tons. The class regulations and international stability regulations still have to catch up. It’s something we’re pushing the class societies to recognize.”

He also remarks that RAL is seeing a growing trend toward tugs that are tailored for each specific operation, though it is different in different parts of the world. For now, designs that meet Tier 4 requirements are a challenge, particularly on vessels that are tightened up against tonnage limits. “We build a lot of tugs that are 499GRT internationally, and any change to those is always an issue,” he says.

“If we need to add some volume into the engine room, we need to take it away somewhere else.”

Rolls-Royce is supplying a LNG propulsion package for an NSK Ship Design cargo carrier for Norwegian shipowner NSK Shipping.

Image: Rolls-Royce

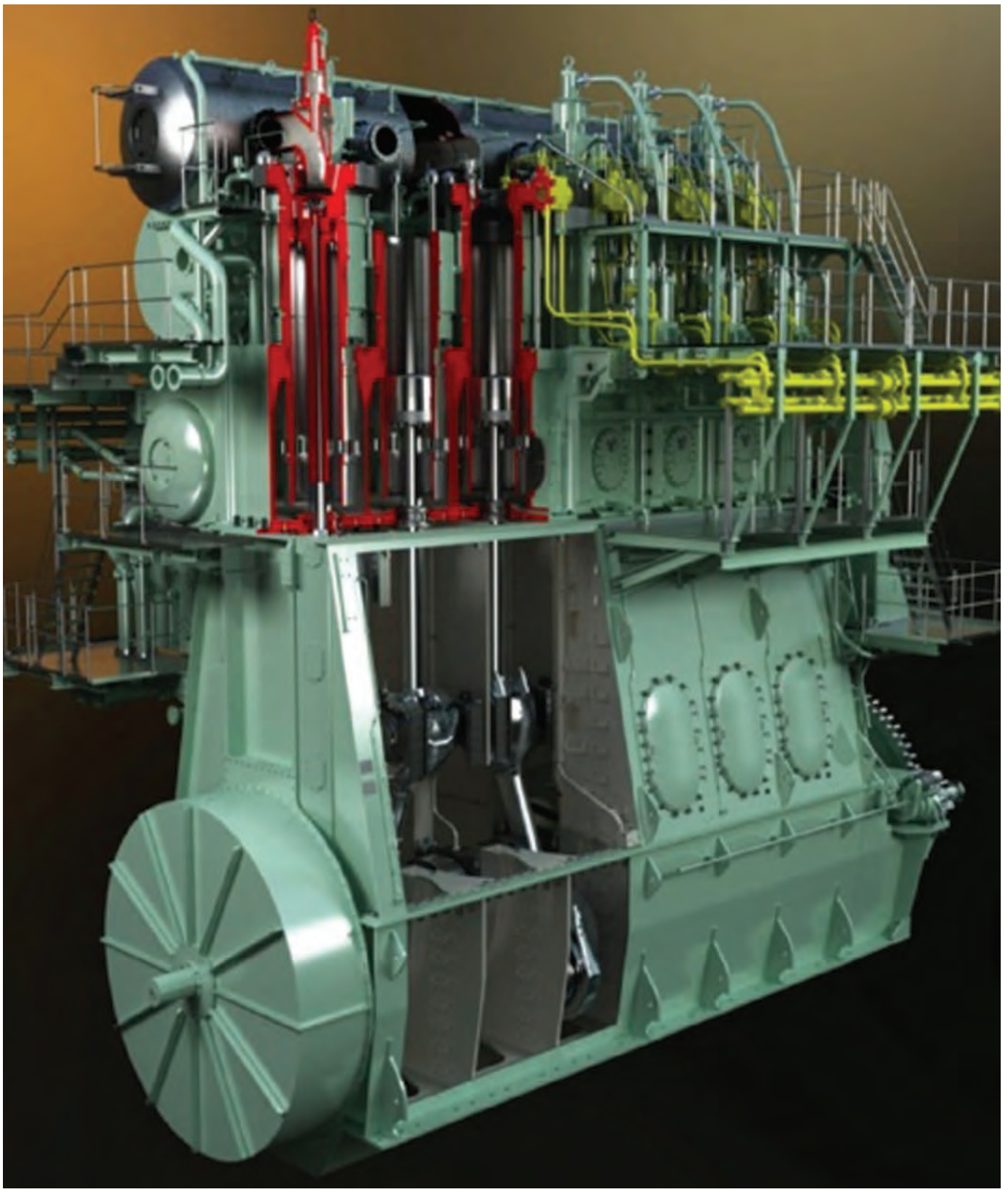
Many Options, Future Still Unclear

Clean Big-Bore Engines for the Future – Challenge for the Research

BY DIPL.-ING PETER POSPIECH

Shipping is vital to the world economy. It is a critical part of international import and export markets and supports the global distribution of goods (About 95 percent of all goods and raw materials transported globally are carried by ships). As for all industries, concerns about climate change require the reduction of greenhouse gas emissions from the shipping sector. This entails higher fuel prices for low sulphur fuels. It also means that the maritime industry must prepare for the new future and investigate alternative, more economical and efficient ship propulsion systems.

Today, the diesel engine is the most widespread of marine prime movers by far. It is a well-understood technology and a reliable form of marine propulsion and auxiliary power generation.



(Photo Courtesy MAN D&T)

But the marine and large diesel engine industries face huge challenges regarding significantly reducing harmful emissions. Over the past years, the contribution of emissions from shipping to the overall emissions has been reduced considerably, and according to the latest IMO study, maritime navigation contributes only 2.2 percent of the worldwide CO2 emissions. But public and political pressure continues to mount, despite the fact that commercial maritime shipping remains to this day the most economical and environmentally benign means to move masses of cargo around the globe. In short, in terms of reducing maritime emissions, there is still much work to be done.

In the immediate future, SCR catalysts, pure natural gas engines or dual-fuel engine concepts will be applied to comply with the IMO emission limits. In addition to the IMO requirements, solutions for a significant reduction of particulate emissions will become necessary very quickly.

Generally, a vast number of promising emission reduction technologies for large diesel engines are already known. Some of them have been tested successfully at test beds and pilot installations. Substantial efforts in research and development will be necessary to transfer these concepts to industrial applications and reliable products. In this context, the quality of fuel available for future large marine diesel engines is of central im-

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Hybrid-drives are a realistic option in the future.

(Photo Courtesy Scandlines)

portance.

It can be assumed that, not later than 2025, fuels with less than 0.5 percent sulphur content may be used worldwide. The fuel sulphur content with the use of scrubbers is not decisive. With this heavy fuel oil has still a long future.

Different studies assume that by the year 2030 significantly more than half of all vessels will still use heavy fuel oil. Whether with 0.5 percent sulphur or with scrubbers will depend on the mineral oil groups and the respective producer countries which affect prices. Despite first tests on board ships with low-sulphur fuel, it might be possible that the mineral oil industry may shy away from expenses for the conversion of the refineries which means that the scrubber will be a focal point. Low-sulphur fuel is still a residual oil with much of by-products – with the use of scrubbers a large part will be washed out. Another key point to remember: the correct disposal of this waste must be ensured.

"However, diesel engines will continue to produce CO2 emissions as well as NOX, SOX, volatile organic compounds and particulate matter (PM)," said Dr. Udo Schlemmer-Kelling, Executive Engineer Technology at FEV GmbH.

Alternative Fuels and Propulsions

Natural gas can be used in reciprocating engine propulsion systems and is a known technology with classification society rules for the fuel systems already many years in existence. Service experience with pure gas engines and/or dual-fuel and converted diesel engines (although limited at the present time) has been satisfactory and currently NG is considerably cheaper than conventional fuels. NG, while not free of harmful emissions, has benefits in terms of CO2, NOX, SOX emissions, given that methane slip is avoided during the combustion and fueling processes.

Gas turbines have been successfully used in niche areas of the marine market and represent a proven high power density propulsion technology. However, the fuel for aero-derivative gas turbines is expensive when compared to conventional marine fuels and gas turbines thermal efficiencies are lower than for slow-speed diesel engines of similar power. Against the use of gas turbines, and the current low fuel price, speaks the poor efficiency as well as the transient behavior at load requirements.

Renewable energy, principally derived from wind and solar origins, is considered as an augment to the main propulsion and auxiliary power requirements of a ship, but is still not widely accepted or incorporated.

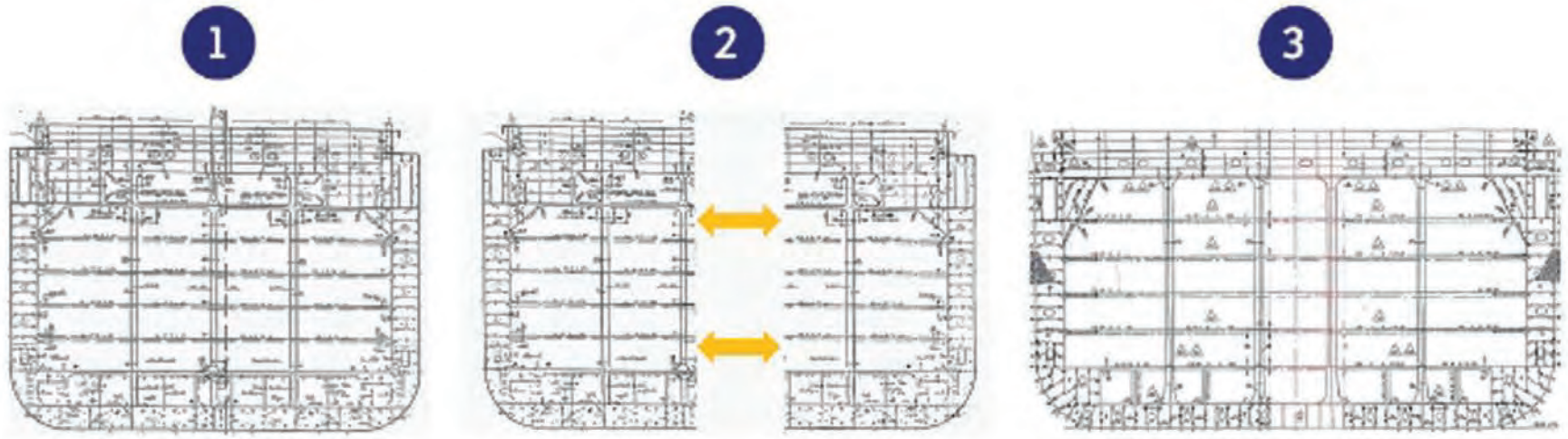
And, not to be forgotten is the endless possibilities of using the electricity option.

A key question to ask in particular surrounds hybrid drives (diesel/gas/electric): specifically, how significant of a role will these units play? Will they dominate in all world regions? Will they remain a niche player by country or ECA area? Only time will tell.

The electrical drive technology will gain considerably in significance in the future in the lower and medium power range – regardless which primary energy will be used. It will gain decisive influence on ship's operation economic efficiency – as it offers best conditions for environmental drives and leads to a

(Photo Courtesy NSB Group)

Cutting and Widening Inserting Middle-Section



(Image Courtesy NSB Group)

number of competitive advantages.

Some traditional statements, that electrical ship propulsion system are working with a poor degree of utilization, i.e. combined with significantly higher losses than mechanical drive systems, and thus are only currently used in special cases, can be referred to as "technically outdated". This insight is not new.

This has not yet properly managed to establish its position in the maritime economy. Well-known cruise shipping companies still swear today by conventional, mechanical propulsion systems. The decisive influence on a growing use of electrical drive systems had the development of the semiconductor technology during the last two decades. At this time existed only components for just a few hundred kW – but today are units of several thousand kW available. With this, combined with an intelligent split of the on-board required energy among several gensets, it is possible to realize electrical ship propulsions with high power. Not only that they are consuming reduced fuel compared to mechanical drives, they are also substantially more 'environmentally-friendly.'

The fully electric powertrain for ships with the todays existing battery technology is entirely illusory. Lead accumulators are too big and too heavy, Li-Ion batteries are too expensive. The required energy of a large VLCC container vessel is about 30GWh. To charge these batteries, a big 2GW power station must run under full-load conditions for about 15 hours, making it unrealistic for an efficient port operation.

But hybrid-drives would be a realistic option in the future.

During the voyage the vessel operates on heavy fuel and before the entrance in special (ECAs) areas or ports, the operation will be done electrically and thus with low-emissions. The required necessary battery capacity is acceptable and

Widening involves the (1) cutting of a containership into four big sections: Cuts are made across the width directly ahead of the superstructure, lengthwise along the midsection from the superstructure to the bow, and ahead of the bow itself. (2) The sections are pulled apart. (3) The resulting gap is closed with pre-produced sections.

can be charged by the main engine during the crossing. With this, shore-power is redundant. Recently a pilot-installation on a large Scandlines ferry has been equipped with this technology and the first results are in.

The four Scandline ferries, on the route Puttgarden to RØdby, feature hybrid propulsions. A total of 25 million EUR have been paid to remove one of the five existing diesel engines, replaced with 399 Siemens-Accumulators with a total power of 2.7 MW hours. They will not be recharged on-shore but at sea by the diesel engines. “By this the fuel consumption is reduced by around 15 to 20 percent,” said Siemens Director Stefan Kraus. The diesel engine exhaust gases are cleaned on top with scrubber by up to 90 percent.

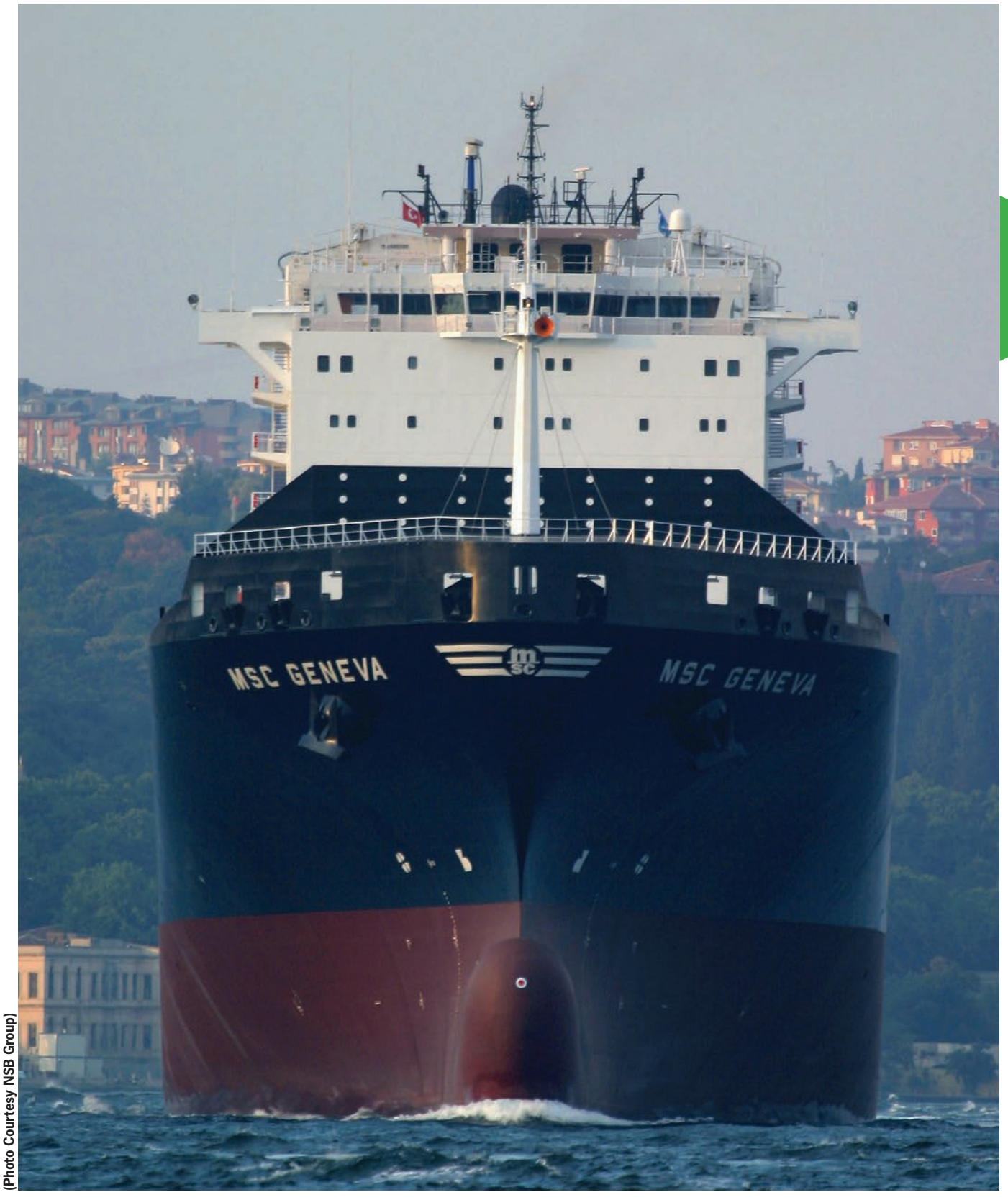
However, several pre-conditions are lacking to ensure fully electrical propulsion. The problem: the 142m long ferries have a port time of only 15 minutes. Fehmarn does not feature, for the time being, a strong and powerful power grid to recharge the batteries during this short time.

“The state of Schleswig-Holstein is open minded and can easily imagine to construct the necessary power connection,” said a speaker of the state.

NSB Group Innovation

Wider is Better

At the shipping company NSB Group, based in Buxtehude, Germany, the emphasis is on the optimization of the “Overall-System-Ship.” This optimiza-



(Photo Courtesy NSB Group)

Widening MSC Geneva

According to NSB, the widening method is a perfect option to enhance the competitive edge of older vessels as it increases the TEU capacity of modified units by more than 20% while operating costs remain the same. The Widening is easy to see with the naked eye, while the benefits and cost efficiencies are as readily evident to the shipowner.

tion includes, for example, a ship-specific new bulbous bow, moving to a new 5-blade propeller (vs. 6 blades) with larger diameter (from 8,200 to 8,600 mm), and an improved water flow to the propeller.

Already a few years ago the company implemented "slow steaming". To do so, it was necessary in cooperation with MAN D&T, to install the system "Turbo Charger Cut Out."

The result:

- Reduction of speed from 25 knots to 12 knots
- Fuel savings: Decreased fuel consumption from 246 mt/d to 35 mt/d (about 85% less mt fuel) with a drastic CO2 reduction
- NOx reduction of 80%
- SFOC increases with decreasing Main Engine Power

MSC Geneva is the world's first "widened" Panamax containership to sail the seas. In addition to the mentioned optimization the "Buxtehude-People" invented a future-oriented, success promising vessel concept.

The MSC Geneva has been running under NSB since mid of 2007, a 4,872 TEU ship measuring 275 x 32 m with a speed of 24 knots. The dimensions made the ship optimal for passage through the Panama Canal, whose new 403-m long and 55-m broad locks are scheduled to open this year.

After the conversion, the vessel particulars are:

Length: 283m
Breadth: 39.76m
Draught (as before): 12m
Deadweight ...65.343t (from 52.095t)
Speed 21.7knots
Container capacity ..... 6,296 TEU

The analyses of the first voyages revealed that the widening has been a success.

Widening involves the cutting of a container ship into four big sections: Cuts are made across the width directly ahead of the superstructure, lengthwise along the midsection from the superstructure to the bow, and ahead of the bow itself. The sections are pulled apart. The resulting gap is closed with pre-produced sections. As the new bulbous bow has been optimized for lower speeds and the ship needs less ballast water to ensure stability due to the new width, the engine however remains unchanged, the

efficiency increases: fuel consumption per ton of cargo decreases by 30% while at the same time more containers can be loaded. NSB Group has already converted three of its ships using this method.

According to NSB the widening method is a perfect option to enhance the competitive edge of older vessels as it increases the TEU capacity of modified units by more than 20% while operating costs remain the same. The IMO Energy Efficiency Design Index achieved equals that of current new buildings. The conversion increases both the load carrying capacity and the transverse stability. It means that less ballast water is needed – another plus when it comes to efficiency. And with regard to sustainability the widened ship is a winner as carbon emissions per ton of cargo are significantly lower and modifying a vessel is less harmful to the environment than building a new ship (EETI at 14 tons homogeneous 14kn is up to 50% higher). “NSB as well as other shipping companies and investors now have the option to either widen the vessels of their fleets, or purchase used ships and widen them,” says Jörg Erdtmann, Director Technical management & Services Reederei NSB.

Can Shipping Help Greece Ride out the Storm?

Photo: Greg Trauthwein

BY JOSEPH FONSECA

Greece is considered to be the world's first ship-owning country in terms of tonnage. The Greeks are known to control 17.7% of world fleet and gaining share except in crude tankers. Even recession in the dry bulk market has not had much effect on the Greek-owned fleet with the fleet size touching 5,226 vessels last year with a total DWT of 334 million.

For debt-laden Greece, shipping – a key element of Greek economic activity since ancient times – is considered a knight in shining armor at this crucial juncture. Most Greek shipping companies are family owned businesses which have been in shipping for many decades, even over a hundred years. Today, shipping is the second largest contributor to the national economy after tourism accounting for 6.5% of GDP, and employing about 290,000 people (7% of the workforce). Earnings from shipping amounted €35.4 billion in 2014.

The Greek fleet flies a variety of flags, however some Greek shipowners gradually returned to Greece following changes to the legislative framework governing their operations and the improvement of infrastructure. A European Community Shipowners' Association (ECSA) report for 2013–2014 reveals that the Greek Flag is the first-most-used internationally for shipping, while it ranks first in the European Union the same ECSA report showed that there are approximately 950 Greek shipping companies in operation.

Greek shipping families are notable for their great wealth and influence in the industry such as the Vardinoyannis, Latsis, Livanos, Niarchos, Angelopoulos and Goulandris. Being traditionally into shipping helped the Greek-run fleets to re-establish themselves under their national flag after the World War ll. The changing dynamics saw them more closely aligned to their own national state, and the establishment of a Greek Merchant Marine service.

Even though today there are about 720 ship management and service offices, the presence in Greece of major international service providers, foreign banks, P & I Clubs, lawyers, brokers, Classification Societies is limited to relatively small offices. As a shipping center there is a limited in scope. One does not see a strong presence of insurance organizations, finance companies, charterers and traders. Friendly and stable legislation would have helped expand the clusters attracting more companies. This could have created more high paid jobs and greater revenues

Ports

Greece is a mountainous peninsula strategically located on the eastern side of the Mediterranean Sea. The country is surrounded by sea from three sides. The northern side borders with other Balkan countries. Due to the many islands, in the Aegean and the Ionian Seas, the country has the longest coastline in Europe and the fifth longest coastline in the world. About 85% of the country's 11 million population lives mostly within 30 miles of the sea, of which 4 million live in Athens, the country's capital.

Although a small nation of 11 million, it has over 80 ports that play a major part in helping the trade of the country. 19 of these are considered busiest maritime ports for passenger transport and 21 for cargo traffic. Piraeus is the main port in Athens and the largest port in Greece.

Privatization has been a key part of government efforts to develop its state assets and raise money to cut Greece's mountainous debt. The government has been targeting 1.4 billion euros from privatizations for last year and 3.7 billion for 2016. Privatization of Piraeus port is still underway and some of the other 12 prominent ports are also likely to follow suit. The government also foresees major macroeconomic benefits to be derived from the privatization of Piraeus port, adding to the GDP and creating new jobs.

Tourism

The strategic location and the extensive coastline has helped to generate a strong influence on Greece's tourism industry. Once a pioneer in cruises it commanded the largest cruise fleet in the Mediterranean way back in the '70s.

Greek cruise ships sailed the Caribbean, Alaska, the Baltic and other places. Today, there are no Greek cruise ships, mainly due to Greek "protective" legislation. From 2012 Greek law is compatible with European legislation. However, because of its history, rich cultural heritage and the unique Greek islands, the country is a prime tourist destination.

Yachting

Because of its location and unique archipelago, Greece has all the settings for becoming the recreational and boating playground of the European Union attracting people from all over the world who enjoy yachting. The Greek Archipelago has about 16,000 km of coastline, 1,200 islands and 4,800 islets and is probably the world's best cruising ground.

The country hosts only about 17,700 pleasure boats of all types and flags. This number includes about 4,000 yachts for charter of which about 500 are manned. But, yachting has been responsible for creating only about 40,000 direct and indirect jobs.

Shipbuilding and Ship Repairs

Shipbuilding activity today is very limited. Only small commercial units for local shipping are being built. Most shipbuilding is now being outsourced to shipyards in China, Korea and Turkey, where labor costs are much lower and are minimally regulated. Only small commercial units of local shipping are being built. Cargo ships cannot be built economically in Greece. Thus, Greece is left with just four to five shipyards and extensive repair facilities that can be considered operational.

Many bigger units were established by Greek shipowners: Hellenic Shipyards by Niarchos in 1956 had built 55 cargo ships until its sale to the State in 1985. Eleusis Shipyards by Andreadis in the mid '60s which built five cargo ships got nationalized in 1975. Neorion Shipyards by N. J. Goulandris in 1970 got sold in 1978. Chalkis Shipyards by J.C. Carras in early '70s which modified two ships into cruise ships and was sold in the '80s. The Salamis Repair Base by Chandris in the '60s is known to have modified 85 ships into cruise ships.

Greek technicians and craftsmen are considered world class. After World War II they modified over 200 cargo ships and tankers into ferry boats and cruise ships. Now, Greek repair facilities are underutilized by the commercial fleet for lack of competitiveness, despite a good, dry climate and a central position in the Mediterranean shipping lanes. Having Greek technicians with technical knowhow which is second to none the industry is hoping for structural reforms to take place so as to become competitive. Once the economic paralysis ends Greece's maritime sector in general and shipping in particular is set to flourish.

Greece By The Numbers

Population:10,775,643 (July 2015 est.)

Waterways:
6 km (the 6-km-long Corinth Canal crosses the Isthmus of Corinth; it shortens a sea voyage by 325 km) (2012)

Country comparison to the world: 106

Merchant marine:

Total:	**860**
By type:	
Bulk carrier	262
Cargo	49
Carrier	1
Chemical tanker	68
Container	35
Liquefied gas	13
Passenger	7
Passenger/cargo	109
Petroleum tanker	302
RoRo	14

Foreign-owned: 42
(Belgium 17, Bermuda 3, Cyprus 3, Italy 5, UK 6, US 8)

Reg. in other countries: 2,459
(Antigua and Barbuda 4, Bahamas 225, Barbados 14, Belize 2, Bermuda 8, Brazil 1, Cabo Verde 1, Cambodia 2, Cayman Islands 9, Comoros 4, Curacao 1, Cyprus 201, Dominica 4, Egypt 8, Gibraltar 8, Honduras 4, Hong Kong 27, Indonesia 1, Isle of Man 62, Italy 7, Jamaica 3, Liberia 505, Malta 469, Marshall Islands 408, Mexico 2, Moldova 1, Panama 379, Philippines 5, Portugal 2, Saint Kitts and Nevis 2, Saint Vincent and the Grenadines 42, Sao Tome and Principe 1, Saudi Arabia 4, Singapore 22, UAE 3, Uruguay 1, Vanuatu 3, Venezuela 4, unknown 10) (2010)

World Rank: 12

Ports and terminals:
Major seaports: Aspropyrgos, Pachi, Piraeus, Thessaloniki
Oil terminal(s): Agioi Theodoroi
LNG terminals (import): Revithoussa

(Source: https://www.cia.gov)

Maritime Turkey set for a Tailwind

BY JOSEPH FONSECA

Turkey is strategically located, straddling both Europe and Asia with substantial number of Black Sea and Mediterranean Sea ports, thus making maritime trade and shipping of great importance to the country's economy. Its extensive coastline running for 8,483 km, (1,067 km of which is island shores) has greatly contributed to the growth of Turkey's maritime sector.

Turkish shipyards have a tradition spanning eight centuries. At the time of the Ottoman Empire, shipyards were able to build large, powerful naval vessels, and yards continued their modernization following the foundation of the Republic of Turkey. Today, the industry boasts modern quality certified shipyards that build ships, yachts, megayachts, and sailing boats, as well as undertake extensive repairs and conversion works.

Turkey's shipyards are mainly located in the Marmara Region, namely Tuzla, Yalova, and İzmit, which have developed into dynamic shipbuilding centers, besides in recent years the emerging Black Sea and Mediterranean regions have increasingly attracted shipyard investments.

The 37 shipyards that were under operation in 2002 increased steadily to 72 as of January 2015. It brought about a transformation as progress in this sub-sector helped generate employment also in the neighborhood, raising the standards of quality of the sub-sector, increasing skilled manpower, ensuring growth and strength of the regional trade and helping to raise not only the standard of living but also the cultural level of labor.

On tonnage basis in CGT, Turkish yards rank 16th in the world's order book. Since they have a good reputation in the building of small and medium tonnage chemical tankers, as a result in March 2015, Turkey climbed up to the 7th place among countries which take tanker orders. Turkish Shipyards delivered 166 ships, DWT of 836,000 between 1995 and 2001. Also, between the years 2002 and 2007, 443 ships with total DWT of 3,051,000 have been delivered. In 2014, 17 ships DWT of 139,073 tons were delivered.

Yacht and Boat Building Industry

Yacht and boat building is one of the most important sectors with its high accretion value and high export ratio. This industry is a combination of sectors in yards which deal with ironing, painting, electric, electronic, textile, decoration etc. Yacht and boat building industry is quite different from shipbuilding because of its concept, scope and technology. Unlike in the shipbuilding industry where long term investments and big coastal areas are needed, boat and yacht building require relatively less investments, areas and production time.

The effects of the decline in shipbuilding activity are quite significant since this is responsible for making a very significant contribution to the Turkish economy.

Ship Recycling

The ship recycling activities is fast gaining ground. It fits in well with the Turkish steel industry, being a comparatively heavy user of scrap steel, which is re-melted in electric arc furnaces and re-used for construction and other purposes (including the building of new ships). It was estimated that Turkey consumes around 24.5 million tons of ferrous scrap, of which 18 million tons is imported, and 6.5 million tons produced domestically

Turkey's 21 ship recycling facilities (located largely in the Aliaga area, near

LimakPort skenderun is located on the Northeast of the Mediterranean Sea and occupies an important place as a transit port. It renders services for transit traffic to Middle East countries as well as East and Southeast Anatolian territories.

Kosbas Terminal serves as a Free Zone.

Photo by Turkish Chamber of Shipping.

Izmir) could be an alternative to the facilities in South Asia and China, especially if they can offer a more environmentally acceptable way of disposing of vessels at the end of their working lives.

Turkish National Ship Registry was established and is regulated by article 839 and various articles under the Turkish Trade Law whereas the Turkish International Ship Registry was set up later on December 12, 1999. Of the 591 ships owned by Turkish vessel owners, only about 15.44 % (by GRT) of the fleet is registered in National Ship Registry and the remaining 84.56 % with the International Ship Registry. The average age of these ships is 24 as of December 31,2014. The country's registered total tonnage both under Turkish flag and foreign flags is 27.5 million DWT globally ranking it at the 23rd place.

Turkish ship owners clearly prefer to flag out using offshore registries for the benefit of low taxation and crew costs. The flagged out vessels operated by Turkish operators is significant. Ship owners prefer flagging their ships under Malta, Panama, Liberia, the Bahamas or St Vincent and the Grenadines flag.

Port Development

Turkey has around 172 ports along its vast coastline of 8483 km. six ports are operated by Turkish Maritime Administrations and two out of seven railway connected ports are operated by Turkish State Railways.

Turkish ports hold a strategic position within the Eastern Mediterranean and Black Sea shipping lines and at the intersection point of East-West and North-South directional International transport corridors. They are in an advantageous position to attract Transshipment / transit cargoes. Ports in all regions of Turkey are so located that they can serve different transportation networks.

The Mediterranean and Aegean Sea ports are located with little miss distance and have an ability to attract Asian-European main shipping lines' cargoes passing through the Mediterranean. Specifically, the Mediterranean ports are in a position to operate as transshipment/ transit ports for delivering cargoes coming from main shipping lines to Middle East and Central Asian countries. Meanwhile, ports in the Marmara Region are important in terms of Turkish connection of Trans-European and Pan-European transport corridors formed by EU and extending those corridors to East. As a result of growing trade and transport volume in Black Sea which is the most important means of access for trading among the landlocked Central Asian countries with Europe, the importance of these ports in the area has increased.

Marine Tourism

Marine tourism has gained in popularity in the past few years with yachting, marina administration, cruise tourism and ferryboat administration, underwater diving and water sports bringing in significant revenue for the country. Marine tourism revenue is 25% of the general tourism which comes to over $ 7 billion. Because of Turkey's vast coastline along the four seas, Turkey is a treasure trove of coves, inlets, bays and beaches at which yachtsmen can choose a different and private anchorage each night. The sailing paradise of Turkey is also home to the Blue Voyage. This idyllic cruise means sailing with the winds, into coves and over the seas and becoming one with nature. For lovers of the active life, sailing in clear waters provides great opportunities for swimming, fishing, skiing, surfing and diving. Sailing in Turkey also allows tourists to experience a truly enriching cultural exchange with the hospitable and gracious people of the coastal villages and towns. The tempered winds which generally blow from the west and northwest make the long summers ideal for yachting, and seem to encourage an appreciation of nature. From some of the turquoise coast's unspoilt and sheltered bays one can see mountain peaks rising to almost 3,000 meters above sea level.

Turkey By The Numbers

Population: 79,414,269 (July 2015 est.)

Merchant marine:

Total:	**629**
Bulk carrier	102
Cargo	281
Chemical tanker	80
Container	42
Liquefied gas	6
Passenger	2
Passenger/cargo	60
Petroleum tanker	25
Refrigerated cargo	1
RoRo	29
Specialized tanker	1
Foreign-owned:	1 (Italy 1)

Registered in other countries: 645

(Albania 1, Antigua and Barbuda 7, Azerbaijan 1, Bahamas 3, Barbados 1, Belize 16, Brazil 1, Cambodia 15, Comoros 8, Cook Islands 4, Curacao 5, Cyprus 1, Dominica 1, Georgia 14, Italy 4, Kazakhstan 1, Liberia 16, Malta 233, Marshall Islands 70, Moldova 18, Panama 62, Russia 101, Saint Kitts and Nevis 18, Saint Vincent and the Grenadines 13, Sierra Leone 9, Slovakia 1, Tanzania 13, Togo 4, Tuvalu 1, unknown 3) (2010)

World Rank: 18

Ports and terminals:

Major seaports: Aliaga, Ambarli, Diliskelesi, Eregli, Izmir, Kocaeli (Izmit), Mersin (Icel), Limani, Yarimca

Container ports (TEUs): Ambarli (2,121,549), Mersin (Icel) (1,126,866)

LNG terminal (import): Izmir Aliaga, Marmara Ereglisi.

(Source: https://www.cia.gov)

Tuzla Shipyard is one of the largest shipyards in Turkey and, throughout its history, it has been identified with remarkable naval work.

Photo by Tuzla Shipyard.

Navy

(Image: DCNS)

Submarine Contract

Australia Taps France

The Australian Government selected DCNS as its partner for the design of 12 submarines for the Royal Australian Navy. The announcement was made by the Australian PM the Hon. Malcolm Turnbull, the Minister for Defense, Senator the Hon. Marise Payne, The Minister for Industry, Innovation and Science, the Hon. Christopher Pyne and The Chief of Navy, Vice Admiral Tim Barrett. "The decision was driven by DCNS's ability to best meet all of the Australian Government's requirements," the Australian government announced. "These included superior sensor performance and stealth characteristics, as well as range and endurance similar to the Collins Class submarine."

The design of the Future Submarine with DCNS will begin this year. The Shortfin Barracuda is a 4,500-ton conventionally powered submarine. It is closely related to the nuclear-powered Barracuda which is 4,700 tons.

First Methanol-fueled Tanker Launched

Launched at the Hyundai Mipo dockyard in Ulsan, South Korea, the newly built Lindanger has become the world's first methanol fueled ocean-going vessel. The ship is the first of two dual-fueled 50,000 dwt tankers owned by Norwegian firm Westfal-Larsen that will be chartered to global marine transportation company Waterfront Shipping.

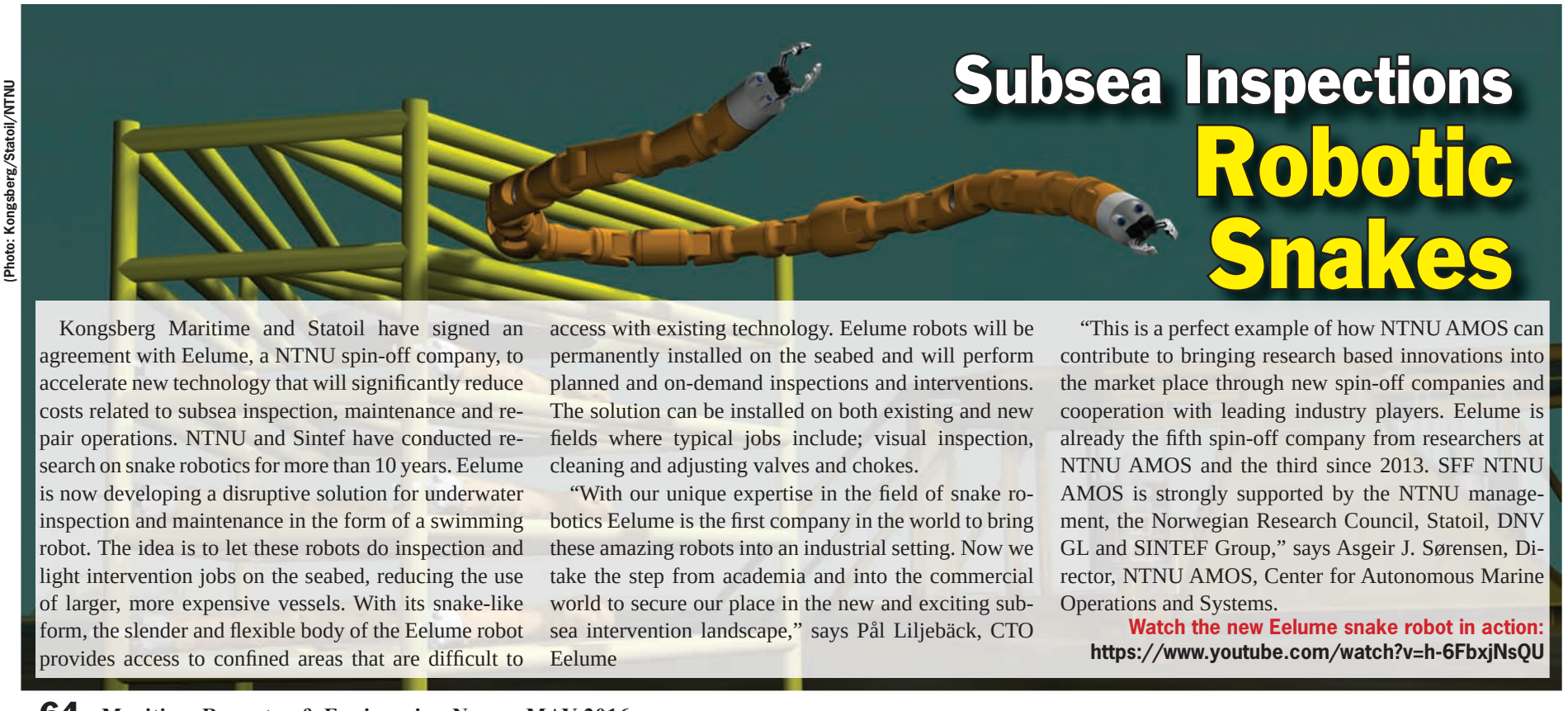
With a MAN designed Hyundai–B&W 6G50ME-9.3 ME-LGI dual-fuel, two-stroke engine on board, the Lindanger can run on methanol, fuel oil, marine diesel oil or gasoil. Lindanger has been assigned the additional notation LFL FUELLED to demonstrate its compliance with the DNV GL rules for low flash point marine fuels. "We are very pleased to see the completion and launch of this exciting and innovative newbuilding," said Knut Ørbeck-Nilssen, CEO at DNV GL – Maritime. "This is the first time a dual-fuel engine with a Low Flashpoint Liquid (LFL) fuel system has been installed on an ocean-going vessel and it is a testament to the excellent cooperation between all the project partners that we have been able to complete this unique project and gain flag state approval. Methanol as a marine fuel is a very promising option to enable owners to reduce the environmental impact of their vessels and to comply with low sulphur and ECA regulations and we look forward to working on many more projects using this innovative marine fuel and technology."

Lindanger is the first in a series of seven vessels which will be chartered by Waterfront Shipping over the course of 2016. Four of the seven vessels are being built to DNV GL class, including two vessels owned by Westfal-Larsen, the Lindanger and a sister ship, and two owned by a joint venture between Marinvest/Skagerack Invest and Waterfront Shipping. Three additional ships, where DNV GL carried out a hazard identification study, will be owned by Mitsui OSK Lines (MOL). Waterfront is a wholly-owned subsidiary of Methanex Corp, the world's largest producer and supplier of methanol, and operates a fleet of 22 deep sea tankers of between 3,000 dwt and 50,000 dwt, which are used for transporting methanol worldwide.

Lindanger Main Particulars

Type	Tanker for chemicals and oil products with LFL fueled engine
LOA	186 m
LBP	177 m
Breadth	32.2 m
Depth	19.1 m
Draft	12.85m
Deadweight	49,999 dwt
Speed	15.8 knots
Main engine	Hyundai–B&W 6G50ME-9.3 LGI (Tier II)
Output	10,320 kW at 100 rpm

(Photo: Hyundai Mipo Dockyard)



(Photo: Kongsberg/Statoil/NTNU)

Subsea Inspections Robotic Snakes

Kongsberg Maritime and Statoil have signed an agreement with Eelume, a NTNU spin-off company, to accelerate new technology that will significantly reduce costs related to subsea inspection, maintenance and repair operations. NTNU and Sintef have conducted research on snake robotics for more than 10 years. Eelume is now developing a disruptive solution for underwater inspection and maintenance in the form of a swimming robot. The idea is to let these robots do inspection and light intervention jobs on the seabed, reducing the use of larger, more expensive vessels. With its snake-like form, the slender and flexible body of the Eelume robot provides access to confined areas that are difficult to access with existing technology. Eelume robots will be permanently installed on the seabed and will perform planned and on-demand inspections and interventions. The solution can be installed on both existing and new fields where typical jobs include; visual inspection, cleaning and adjusting valves and chokes.

"With our unique expertise in the field of snake robotics Eelume is the first company in the world to bring these amazing robots into an industrial setting. Now we take the step from academia and into the commercial world to secure our place in the new and exciting subsea intervention landscape," says Pål Liljebäck, CTO Eelume

"This is a perfect example of how NTNU AMOS can contribute to bringing research based innovations into the market place through new spin-off companies and cooperation with leading industry players. Eelume is already the fifth spin-off company from researchers at NTNU AMOS and the third since 2013. SFF NTNU AMOS is strongly supported by the NTNU management, the Norwegian Research Council, Statoil, DNV GL and SINTEF Group," says Asgeir J. Sørensen, Director, NTNU AMOS, Center for Autonomous Marine Operations and Systems.

Watch the new Eelume snake robot in action:
https://www.youtube.com/watch?v=h-6FbxjNsQU

McDermott Names Flagship Pipelayer

(Photo: McDermott)

The naming ceremony of DLV 2000, a high-specification deepwater derrick lay vessel at the Keppel Singmarine Shipyard.

McDermott International, Inc. formally named its flagship Derrick Lay Vessel 2000 (DLV 2000) during a ceremony at the Keppel Singmarine Shipyard in Singapore.

Brenda Cuthbertson, wife of 38-year McDermott employee and Asia Area Vice President Hugh Cuthbertson, served as the vessel's godmother and named the DLV 2000 with the traditional breaking of champagne during the ceremony. The DLV 2000 is a class 3 dynamically positioned vessel combining a 2,200-ton revolving crane with a deepwater under deck S-lay pipelay system configured to install pipelines with diameters ranging from 4.5 to 60 in. in water depths up to 10,000 ft. The vessel can accommodate up to 400 personnel to facilitate large hook-up and commissioning projects, has a fast transit speed and incorporates a large, 43,000 sq. ft. open deck to allow the transportation and assembly of large subsea structures; enabling safe and efficient stand-alone operations in remote areas.

The DLV 2000's first assignment is scheduled offshore Western Australia on the INPEX Ichthys LNG Project. The DLV 2000 is expected to join the project in May 2016 for several months as part of McDermott's work program by providing heavy construction support for the subsea system. Work is scheduled to be performed in conjunction with McDermott's other new subsea installation vessel, the Construction Support Vessel 108 (CSV 108), which is working successfully on the project. The CSV 108 is expected to undergo an upgrade later in 2016 to install a Vertical Lay System and Reel Deployment System for use on the project and will then be referred to as the Lay Vessel 108 (LV 108).

Additionally, the DLV 2000 is scheduled to support the transportation and installation contract awarded by Woodside Energy Limited for the Greater Western Flank Phase 2 subsea pipeline and installation project in Western Australia.

www.mcdermott.com

Offshore Wind Vessel Christened Atlantic Pioneer

(Photo: Blount Boats)

Powered by MAN engines driving Hamilton Jets through ZF fears, Atlantic Pioneer cruises at 26 knots and exceeded sprint speeds of 30 knots durin sea trials.

(Photo: Eric Haun)

Charles A. Donadio Jr, christens Atlantic Pioneer at a ceremony at Quonset Point in North Kingstown, R.I. Below, suspension seating for a smooth ride.

(Photo: Eric Haun)

Serving notice that U.S. yards can and do build workboats for the nascent North American offshore wind farm industry, Blount Boats has delivered the Atlantic Pioneer, America's first U.S.-flagged crew transfer vessel (CTV) for Atlantic Wind Transfers. Atlantic Wind Transfers is the commercial wind support services subsidiary of Rhode Island Fast Ferry, which secured a 20-year contract from Deepwater Wind Block Island, LLC to operate the vessel for the nation's first offshore wind farm, beginning in May 2016.

Christened on April 22 at a ceremony at Quonset Point in North Kingstown, R.I., Atlantic Pioneer is a 21-meter twin hulled, all-aluminum catamaran built to service the Block Island Wind Farm, which will be the first offshore wind farm to take shape in the U.S. with a five-turbine site that will provide 30MW power for Block Island.

Designed by South Boats IOW (Isle of Wight), which has designed and built approximately 81 crew transfer vessels for service to the European offshore wind sector, Atlantic Pioneer was built by Rhode Island's Blount Boats, which in 2011 signed an exclusive licensing agreement with South Boats covering the U.S. offshore wind industry.

"We take pride in every boat we build, but this boat is very special – the first U.S.-flagged vessel serving the first offshore wind farm in the United States," said Marcia Blount, president and chief financial officer at Blount Boats. "Built in Rhode Island for a Rhode Island operator servicing a Rhode Island wind farm; it doesn't get any better."

"This is the first vessel of its kind built in the United States. No one has built a boat like it. That's what makes it very, very unique," said Charles A. Donadio Jr., President of Rhode Island Fast Ferry.

Donadio said Atlantic Pioneer is also a "cross-platform vessel." It is dual certified to USCG subchapter L (offshore supply vessel) to carry up to 16 offshore workers and subchapter T (small passenger) to carry up to 47 passengers. "We can carry the technicians, but we also went one step further . . . certifying as a T passenger boat," Donadio said. "So we can actually take this boat out with 47 passengers and do a little tour around the bay or some small wind farm tours."

Atlantic Pioneer's propulsion system consists of two MAN V12-1400 hp engines, ZF Marine 3050 Gears, and Hamilton Jet HM571 waterjets. The vessel exceeded the contractual performance during sea trials, reaching sprint speeds in excess of 30 knots, with the ability to cruise (80 percent power) at 26 knots when in a light condition.

A Cummins Onan 17kw generator provides AC power to the air conditioning system, a heating system and small galley.

A PTO driven hydraulic system powers a deck crane, fire pump, fuel transfer pump and a salt water pressure washing system. All other equipment is fed DC power through house batteries.

The vessel is engineered to carry up to 12 tons of cargo in the bow and 3 tons in the stern. The forward and after decks are outfitted with cargo lashing and container sockets. The bow has a boarding/loading platform to allow offshore workers to make the transition from the vessel to the wind turbine. The vessel, capable of making transfers in 1.5-meter significant wave heights, connects to the turbine base by use of a special bow fendering system. Atlantic Pioneer is coated with the anticorrosive ORCA HT Offshore vinyl film from Orca Maritime above sea level, including superstructure, hull and tunnel.

The interior of the deckhouse is outfitted with a head, a small galley area with settee seating, 12 suspension seats, storage lockers, entertainment system, Wi-Fi and sound absorbing decking. The entire deckhouse is isolated from the hull with vibration mounts for a quieter and smoother ride to and from the work site.

Atlantic Pioneer Main Particulars

Length, o.a.	70.2 ft. (21.4m)
Max Beam	23.95 ft. (7.3m)
Trim Control	Humphree Interceptors
Length, DWL	59.33' (18.08m)
Draft	4.06 ft. (1.24m)
Generator	Cummins Onan
Gearboxes	ZF model 3050
Service Speed	26 knots
Windows	Sea Glaze Marine Windows
Waterjets	Hamilton HM571
Paint	International Paint
Cargo DWT	12 Tons fwd & 3 Tons aft
Seats	Cabin / (12) Seat Design Co. b
Passengers	up to 47
Engines	MAN V12-1200CR [V-Nue]
Interior Lighting	Imtra (24v LED)
Builder	Blount Boats, Inc.
Cargo DWT	12 Tons fwd & 3 Tons aft
Displacement (Lightship)	45 LT
Designer	South Boats IOW
Window Wipers	Exalto/Decca
Total Fuel Capacity	2100 U.S. gal.
Fire Detection	Seafire
Air Conditioning	Dometic Cruise Air

Moose M3 Multi-Missioned Platform

When Moose Boats first built its M3 (34.4 ft. LOA) monohull demonstrator in 2011, the move may have surprised some stakeholders. After all, Moose is widely considered one of industry's most prominent catamaran builders. No one should have been surprised when the Moose monohull provided so much value in such a compact hull. The intent was to offer all the design features, ergonomics and quality of Moose Boats catamarans in a smaller, more tactically maneuverable and less expensive platform. Twin Yamaha outboard 300s propel the demonstrator at speeds that can reach 47 KT. Twin Yamaha outboard 300s propel the demonstrator at speeds that can reach 47 KT. Moose shied away from water jets, in part because the installation of inboard engines and drives would reduce space and functionality in the cockpit. Should a customer desire, the monohull can accommodate up to twin 350s or triple 300s, should that kind of power be mission necessary. Another M3 was also built for New Orleans Fire Department. With the firefighting configuration, the vessel pumps up to 1,500 gpm, adding to its multi-mission potential. The M3-30 demonstrator – the Moose designation due to it's just under 30' hull length – has proven its performance to San Francisco Bay Area and Los Angeles marine law enforcement and is currently under evaluation by agencies in the Northeast United States. The hull comes at an attractive price point, and gives an organization the opportunity to do more with less hulls, each of which will accomplish much more.

(Photo: Moose)

Metal Shark Delivers to Canaveral Pilots

A pilot boat delivered this past year to the Canaveral Pilots Association at Port Canaveral, Florida is a custom 45-foot aluminum vessel built at Metal Shark's newly-opened shipyard in Franklin, Louisiana. Canaveral Pilots specified a purpose-built pilot boat design by naval architect Bill Preston. The design utilizes the weight of a single bow-mounted diesel engine and an extremely sharp forward entry to slice levelly through waves as opposed to riding over the top of the crests and then plummeting into the troughs. Due to its enhanced stability, this proven design is used by several pilot groups operating in the often adverse open ocean conditions encountered along Florida's Atlantic Coast. Metal Shark added its own unique touches to the design, such as its use of wraparound "pillarless" glass in the pilothouse to substantially reduce blind spots for greatly enhanced safety during inclement weather or night operations.

Willard Marine's Twin Diesel RIB; Meet the 777

Rigid hulled inflatable boats (RIBs) have come a long way since their initial development in the United Kingdom in the late 1960s. Long noted for their stability and safety in turbulent seas, they have found applications in rescue work and military settings.

Willard Marine, Inc. of Anaheim, Calif. has a long history of conventional hulls and RIBs. The company currently produces a variety of models and sizes of RIBs from 4.9-meters up to 11.07. As are all the firm's RIBs, the SEA FORCE 1100 is available with either fiberglass or aluminum deep-V hulls. Primarily designed for the US Navy, the Sea Force 1100 has been internationally marketed and is also available for civilian uses such as whale watching or local tours.

With a 3.6-m (11.75 ft.) beam on its 11.07-m (36.4 ft.) length this is a big boat with huge capabilities. In addition to nine crew seats aft of the center console, seating for up to 17 passengers is provided in the forward section of the hull. A non-skid-coated decked space, just ahead of the operator's console and over the engine compartment, can carry up to 4,870 pounds of cargo.

A pair of Cummins six-cylinder, EPA tier 3 rated, QSB6.7-liter engines each rated for 380 horsepower provide propulsion. The engines power Hamilton HJ292 water jets through ZF-280-1 gears with 1.214;1 ratios. With this power, the boat has, at 17,600 pounds, a speed of 38 knots. At 20,000 pounds of total weight, the boat achieves 34 knots. The bollard pull with this configuration of power is 5,600 pounds.

These are big, powerful people movers with deep-V hulls and a fine entry tapering to a 19-degree deadrise at the stern. The 40-ounce UV-coated polyurethane tube that surrounds the hull has eight compartments, filled with three-PSI of air pressure.

Designated "Landing Platform Dock (LPD-17 Class), LCS" by the US Navy, the RIB can be ordered with enclosed cabins or other superstructure modifications.

(Photo: Alan Haig-Brown)

Primarily designed for the US Navy, the Sea Force 1100 has been internationally marketed and is also available for civilian uses such as whale watching or local tours.

Willard Unveils Sea Force 777 RHIB

In 2015, Willard Marine unveiled their new SEA FORCE 777. This military-grade, fiberglass, rigid hull inflatable boat (RHIB) is 7.77-m long, 2.74-m wide, and designed with a deep-V hull for maximum stability in the roughest sea conditions.

The Steyr SE306J38 diesel engine with ZF-63 marine gear powering a Hamilton Jet drive HJ-274 provides 300 horsepower for a nine-member crew and can achieve 32 knots. Nine Ullman Dynamics shock-mitigating seats are installed for crew comfort and safety. A 40-ounce polyurethane WING inflatable collar is UV-coated and includes a seven-panel bow cover and rub-strakes to reduce risk of boat damage upon boarding and stability during weight shifts. International military representatives can now rely upon the new 777 the same way the U.S. Navy has relied upon similar shipboard RHIBs from Willard Marine over the last 25 years.

(Photo: Willard Marine)

Willard Marine unveiled their new SEA FORCE 777. This military-grade, fiberglass, rigid hull inflatable boat (RHIB) is 7.77-meters long, 2.74-meters wide, and designed with a deep-V hull for maximum stability in the roughest sea conditions.

Gladding-Hearn Delivers for Tampa Bay Pilots

The Tampa Bay pilot association has taken delivery of its second Chesapeake Class launch and the first in a new generation of Gladding-Hearn Shipbuilding's mid-size pilot boats. Since the Chesapeake Class pilot boat was introduced by the shipyard in 2003, 15 have been delivered to pilot associations throughout the United States. The latest improvements incorporate the performance benefits of Volvo Penta's IPS 2 pod system. With a deep-V hull designed by C. Raymond Hunt & Associates, the all-aluminum pilot boat is powered by twin Volvo Penta D11, six cylinder, EPA Tier 3 diesel engines, each producing 503 Bhp at 2250 rpm. Each engine is connected to a Volvo Penta IPS propulsion pod, which is fitted with dual forward-facing, counter-rotating propellers and integrated exhaust system, and Volvo Penta's integrated EPS electronic steering and control system. The financial incentive for the Tampa Bay pilots to optimize fuel economy, vessel handling and comfort led the shipyard to install a Humphree Interceptor automatic trim-optimization system. The vessel's top speed is 28 knots. Key design changes to the Chesapeake Class MKII include positioning the wheelhouse aft of amidships to improve comfort and provide for a larger foredeck.

MetalCraft's 9m RIB

MetalCraft Marine has introduced an all new 9m Rib. Based on a previous hull design, it is crossing into new territory in naval architecture, geared for offshore Vessel board and seizure and insertion/extraction missions from over the horizon. The boat can be configured for both military and municipal security configurations. According to Metal Craft, two production lines are rolling for full rate production throughout the next two years, based on current delivery orders. Metal Craft could not divulge the current back order information. In 2015, two orders specify Mercury Verado350s and one order specified Yamaha 350s. The boat has many guns with four mounts, fore and aft and two foldable swivel mounts centered. It is one of the first Naval patrol boats to utilize the British Sea Cross navigation platform that offers a revolutionary targeting program. The boat has ShoxsHD suspension stackable seats for two crew and 12 boarding team members.

Repower Brings Ferry into IMO Tier III Compliance

Norwegian ferry Bastø Fosen I is the first vessel commissioned with a globally certified International Maritime Organization (IMO) Tier III compliant marine engine that does not need urea based after treatment.

The refurbished and repowered Bastø Fosen I was equipped with GE's Marine Solutions 16V250MDC, a 16 cylinder 250 mm bore marine diesel engine that is certified to meet both IMO Tier III and EPA Tier 4 emission standards, reducing key emissions by more than 70 percent.

GE said choosing a medium speed engine with EGR technology over urea based systems saves engine room space by eliminating the need for a separate SCR system and urea storage tanks, preserving space for cargo, accommodation and fuel, water and oil tanks. Additionally, this option minimizes operating expenses, as urea based systems can add 5-8 percent of fuel expenses, while also maximizing engine efficiency and load response with a ramp up from idle to full load of about 15 seconds.

The Norway stationed Bastø Fosen I ferry is commissioned to cross the Oslo fjord, operating the 30-minute route between Horten and Moss. The route currently uses three ferries, carrying 2.5 million people annually. The Bastø Fosen II ferry will make the trek to Fiskerstrand Verft AS in the fall for refurbishing and installation of its own IMO Tier III compliant GE diesel engine. Bastø Fosen has also ordered six, 8L250MDC, IMO III compliant eight-cylinder in-line engines for three new ferries currently under construction, which launch later in 2016.

Image: GE

Image: Northern Lights

Genset Controls

Northern Lights introduced the Tough Series Control Panel (TSC) to provide control to Northern Lights generator set functions. Featuring a back-lit LCD display screen and large, easy-to-read push buttons, TSC is versatile enough to permit remote monitoring and control connection through a single data and power cable, up to 30 meters in length, the manufacturer said. Available RS485 and J1939 protocols can be connected to a remote monitoring system. The TSC is factory programmed with voltage and current monitoring for single and three-phase applications. Pressure and temperature warnings and shutdowns are standard to help protect generator sets. Warnings and shutdowns for frequency and voltage protect electrical equipment. Sound enclosure mounting is available for a quiet and streamlined engine room.

The Tough Series Controller is available on a wide range of Northern Lights generator sets, both marine and land-based. The Northern Lights family of marine generator sets includes products from 5-545kW. Northern Lights Commercial series generator sets include products from 20-150kW.

www.northern-lights.com

Thordon Bearings Proof in the Numbers

Thordon Bearings developed a bespoke modelling tool capable of calculating the amount of operational oil prevented from leaking into the world's oceans with each installation of a seawater-lubricated propeller shaft bearing. Launched April 22 to coincide with Earth Day 2016, the Oil Savings Calculator shows that more than 60 million liters of oil pollution has been saved to date.

"In our opinion the only acceptable propeller shaft stern tube oil leakage is zero." said Terry McGowan, President & CEO Thordon Bearings. "Thanks to those vessels that have already installed seawater-lubricated propeller shaft bearings, over 60 million liters (almost 16 million U.S gallons) of stern tube oil has been saved from entering our oceans, seas, lakes and rivers. The Oil Saving Calculator is updated constantly and will continue to track our contribution to removing stern tube oil from our waters with the greater goal of completely eliminating this source of pollution." The oil saving calculation is based on detailed statistical analysis of the number of vessels that have been built with or converted to seawater lubrication, the 300 days a year each vessel is typically operational and an average oil leak of 6 liters per day per vessel. Independent research carried out by New York-based Environmental Research Consulting indicated in 2014 that the total amount of operational oil discharges from ocean-going vessels could be more than 240 million liters annually. To add perspective, the oil pollution from the Exxon Valdez casualty of 1989 was 41.6 million liters. Shipowners can monitor the positive impact the seawater-lubricated propeller shaft bearing is having on the marine environment by checking the Oil Saving Calculator counter at

www.thordonbearings.com

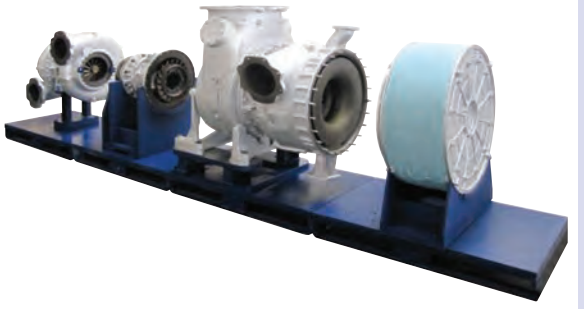


Image: KBB

KBB Turbocharging Solutions

'Knowledge to Boost' (K2B) two-stage turbocharging system.

KBB, at the forefront of turbocharger technology and R&D, has noted the marine trend of focusing more on efficiency and emissions reduction versus outright power production, responding by continually developing several projects, such as single-stage high-pressure turbocharging, two-stage turbocharging as well as various exhaust-gas recirculation (EGR) concepts.

The KBB ST27 – series achieves pressure ratios of up to 5.5:1, and while cost and simplicity are keywords that define the technology of single stage turbocharging, higher charging pressures are key to meeting both performance and emissions reduction criteria on current engines. This is particularly relevant for dual fuel engines, and diesel engines fitted with exhaust-gas after-treatment or EGR, which can help to comply with IMO Tier III regulations.

Two years ago KBB saw the launch of a series of engines with its 'Knowledge to Boost' (K2B) two-stage turbocharging system. With intermediate cooling they provide the possibility of turbocharging diesel, heavy fuel oil and gas engines with an engine output up to 5 MW. Pressure ratios of 10:1 may be possible when combining both LP and HP turbocharging.

www.kbb-turbo.de

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New Design: VectRA Series of Voith Tractor Tugs

The new VectRA 3000 Class Tug is a high performance VSP Tractor tug designed by Robert Allan Ltd in close collaboration with Turkish shipbuilder Sanmar and Voith Turbo Propulsion, with performance verified via model testing. The propulsion arrangement features high speed diesel engines connected to the Voith units via reduction gearboxes with integral clutches. With a bollard pull of 70 metric tons, the VectRA 3000 form is designed to generate escort steering forces in excess of 100 metric tons. Additionally, the design has fire-fighting and oil recovery capabilities and is fully MLC compliant. The VectRA 3000 was designed exclusively for Sanmar. The first vessel in the series, the M/T Ares, built for Italian tug owner Tripmare S.p.A., was launched at Sanmar's new Altinova advanced shipbuilding facility in February 2016.

Unique for a VSP installation, the propulsion drive train comprises a pair of CAT 3516C high speed diesel engines, each rated 2,525 kW at 1,800 rpm, and driving Voith 32R5EC/265-2 cycloidal propellers. The engines are connected to the Voith drives through a pair of Reintjes WAF 863 gearboxes and Vulkan composite shafts, rather than using the more traditional turbo coupling. This combination is smaller, lighter and less costly than the traditional medium speed drive system. The electrical plant consists of two identical diesel gensets, each with a rated output of 86 ekW.

All towing, ship handling, and escort work is performed using a double drum escort winch and escort rated staple fitted on the aft deck. One drum can store 710m of steel wire line, while the other stores 150m of synthetic towline. For increased operational flexibility radial type tow hooks are installed on the main deck forward and aft.

As in a traditional tractor configuration, the stern is the working end of the tug, and as such features heavy duty cylindrical fendering with a course of 'W' fenders below. Hollow 'D' fenders protect the sheer lines and tie neatly into the 'W' fenders at the bow.

The wheelhouse is designed for 360 degree visibility and includes overhead windows. The split type console is biased aft to ensure unobstructed visibility of the working deck (including the winch, staple, bulwarks and fenders) during operations.

Image: Robert Allan Ltd.

TENMAT

Rudder & Stern Tube Bearings

TENMAT, to keep ship owners up and running as quickly as possible, is stocking its line of advanced marine bearings at its North American Distribution Center in Delaware to better serve urgent repairs. Base tubes of various lengths and diameter are now available in stock for immediate shipping, including overnight options. TENMAT has been manufacturing composite materials for the marine market for several decades and supplied more than 8000 vessels with high quality FEROFORM & RAILKO bearings.

TENMAT bearings are approved by all major Classification Societies for use in stern tube and rudder bearing applications in commercial ships as well as military vessels and come with a 15 year limited warranty.

www.tenmat-marine-bearings.com

Image: Tenmat

ENOC

Marine Lubricants

ENOC Marine is a business that supplies lubricants and provides technical support services to the international marine industry. Headquartered in Dubai, Marine Lubricants has an extensive portfolio of application-based lubricants, each designed to address the specific challenge of achieving optimum performance. ENOC's marine lubricants division offers a comprehensive product portfolio to over 80 ports across 16 countries. The divisions product - STRATA marine lubricants - covers all types of marine main engines along with a complete range of products which covers all the marine applications, producing these products via a global network of lubricant blending plants, ensuring security of supply. ENOC Marine Lubricants distributor network provides the local flexibility and responsiveness that many customers need.

www.enoclubricants.com

Image: ENOC

Crowley

Third LNG-Ready Tanker Delivered

Crowley Maritime has taken delivery of Louisiana, the third of four new, Jones Act product tankers being built for the company by Philly Shipyard, Inc. (PSI). The 50,000-dwt Louisiana is capable of carrying 330,000-barrels of product. Crowley's fourth product tanker is under construction at PSI, with delivery planned for Q3 2016. Louisiana joins sister ships Ohio and Texas, which were received by Crowley in 2015 as the first-ever tankers to receive the American Bureau of Shipping's (ABS) LNG-Ready Level 1 approval. The approval allows Crowley to convert the tanker to liquefied natural gas (LNG) propulsion in the future. The tankers are based on a Hyundai Mipo Dockyards (HMD) design that incorporates numerous fuel efficiency features, flexible cargo capability and the latest regulatory requirements. The vessel is 600 ft. long and is capable of carrying crude oil or refined petroleum products, as well as various chemical cargoes.

Image: Crowley

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ANTI-CONDENSATION COATINGS

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BARGE FABRICATION

McDonough Marine Services, 3500 Causeway Blvd., Suite 900 Metairie, LA 70002 , tel:(504) 780-8100, fax:(504) 780-8200, dwalkowski@mcdonoughmarine.com

COATINGS/ CORROSION CONTROL/ PAINT

Hempel A/S, Lundtoftegårdsvej 91 2800 Kgs. Lyngby , tel:45 4593 3800, fax:45 4588 5518, marine@hempel.com , www.hempel.com

Tri-State Coating and Machine Co. Inc., 5610 McComas Road, PO Box 296, Salt Rock, WV V4W 3S8, USA , tel:1-800-477-4460, fax:304-736-7773, brichmond@tscminc.com

COMMUNICATIONS

David Clark Company (Wireless Headset Communication Systems), 360 Franklin Street, Worcester, MA 77060, USA , tel:(800) 298-6235 , www.davidclarkcompany.com/marine

CORDAGE

Helkama Bica Oy, Lakimiehenkatu 4, KAARINA FI-20780, Finland , tel:+358-2-410 8700, sales@helkamabica.fi , www.helkamabica.com

COUPLINGS

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Anticipated Issue Date: Between May 2, 2016 & May 16, 2016
Project Number: DLN182122I

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For RFI information please visit the OSU Business and Bid Opportunities website at **http://bid.oregonstate.edu/**
For additional information please contact Deanne Lahaie-Noll by email at **deanne.lahaie-noll@oregonstate.edu** or by telephone at **(541) 737-1150**

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